

# ASTRoMaP Atlanta Strategic Truck Route Master Plan



**DRAFT**  
**Strategies and**  
**Recommendations**



## Table of Contents

INTRODUCTION .....	4
Infrastructural Improvements .....	4
Introduction.....	4
Project Worksheet .....	4
Cost-Benefit Analysis and Cost Estimation.....	5
Project Assignments.....	5
Policy or Design Strategies .....	7
Introduction.....	7
Context Sensitive Solutions .....	7
Environmental Justice and Health Considerations.....	7
Access Management .....	8
Roundabout Designs and Implementation .....	9
General Design .....	9
Truck Aprons .....	10
Traversable Islands .....	10
Decision Sight Distance.....	12
Education Documentation.....	13
“How To” Guides.....	14
Safety Related Statistics .....	14
Signage Practices.....	15
Addressing At-Grade Rail Crossings.....	16
Introduction .....	16
Highway-Rail Grade Crossing Collisions .....	17
Class I Railroads.....	17
Short Line Railroads.....	17
Site Surveys .....	18
Locations of Parallel Tracks.....	23
Crossings of Concern .....	24
Prioritizing At-Grade Crossings .....	24
Summary.....	26
PROJECTS .....	27
Short, Medium Term .....	27
NS-E0-01.....	27
NS-E0-02.....	28
NS-E0-03.....	29
NS-E0-04.....	30
NS-E0-05.....	31
NS-E0-06.....	32
NS-E1-03.....	33
NS-E1-04.....	34
NS-E1-05.....	35
NS-E1-06.....	36
NS-E1-07.....	37
NS-E1-08.....	38
NS-E1-09.....	39
NS-E1-10.....	40
NS-E1-11.....	41
NS-E1-12.....	42
NS-E3-01.....	44

NS-E4-03.....	45
NS-E4-04.....	46
NS-E4-05.....	47
NS-W1-01.....	48
NS-W1-02.....	49
NS-W1-03.....	50
NS-W2-04.....	51
NS-W2-05.....	52
NS-W2-06.....	53
EW-N1-01.....	54
EW-N1-02.....	55
EW-N2-01.....	56
EW-N2-03.....	57
EW-N2-04.....	58
EW-N2-05.....	59
EW-N2-06.....	60
EW-N2-07.....	61
EW-N2-08.....	62
EW-N2-09.....	63
EW-N4-01.....	64
EW-N4-02.....	65
EW-N4-03.....	66
EW-N4-04.....	67
EW-S1-01.....	68
EW-S2-01.....	69
EW-S3-02.....	70
CNS-WD-01.....	71
Wesley-01.....	72
Capital Expenditure Projects.....	73
Project Acknowledgement.....	73
CapEx NS-W2.....	73
CapEx NS-E1.....	74
CapEx NS-E2.....	75
CapEx EW-N1.....	76
CapEx EW-N1.....	77
CapEx EW-N2.....	78
CapEx EW-N4.....	79

## INTRODUCTION

By applying the Criteria Matrix and “scoring” individual segments along multiple roadways, portions of the assigned ASTROMAP system were identified as not meeting the optimal expectations to attract and convey truck traffic.

In addition, the outreach process and the sequence of real-time truck travel data compiled identified further specific locations or segments that were not observed as conveying truck traffic efficiently.

To properly assess these concerns, engineers traveled a significant proportion of the entire system. Observing conditions on the designated corridors and connectors, in conjunction with the locations identified as described above, improvement projects were documented. These route observations were conducted from March 08 thru March 24, 2010. In addition, indirect route observation, aerial route assessment, was conducted to further enhance project assessment in areas requiring linear projects across multiple miles of a given corridor.

## Infrastructural Improvements

### Introduction

During each route observation, engineers would review roadway conditions. Potential improvement was guided by AASHTO “truck friendly” recommendations, segments that scored as deficient and “on the ground” observations of existing truck activity.

The focus of these assessments was to identify short or medium term projects that would contribute to the utilization of the corridor or connector in a “quick win” to ten year timeframe. These also could be implemented with little to moderate funding by associated agencies and jurisdictional bodies. Assisting with long term planning, where budget requirements are high and extended scheduling is required, projects requiring ten or more years and projected funding needs of \$20 million or more were also identified. This latter category was titled Capital Expenditure or CapEx projects to distinguish them from the focus project grouping.

Within the varying context of the Atlanta region, roadway improvements should incorporate urban design characteristics that reinforce urban character, such as pedestrian-scale and aesthetic treatments that encourage all modes of transportation including trucks. Maintenance and enhancement of community character is important to sustain livability within the urban context.

### Project Worksheet

Engineers prepared Project Worksheets for each improvement. These notated, by project:

- Route: Corridor or connector ID
- Location
- Source: Observation type
- Jurisdiction: Expected agency or body to guide project
- Concern: Issue observed

- Proposed Actions:
  - Interim Solution: If one existing
  - Solution: Identified corrective action
- Picture or Map: illustrating relative location of project

A total of forty-nine projects were identified within the focus grouping and seven CapEx projects. The focus group was assessed for projected cost utilizing the Georgia Department of Transportation CES (Cost Estimate) tool to provide estimates for:

- Preliminary Engineering
- Utility Relocation
- Construction
- Right of Way Purchase

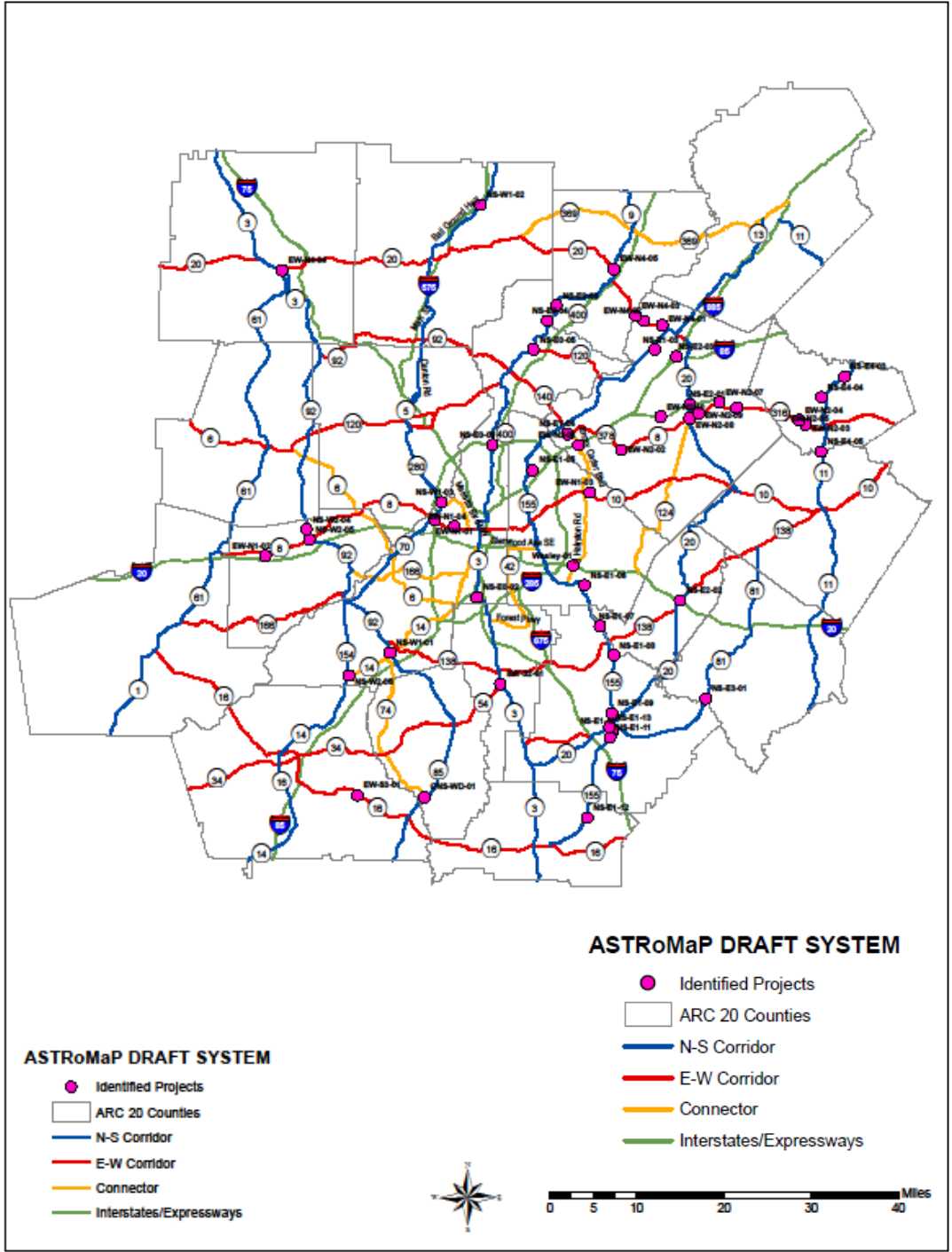
### Cost-Benefit Analysis and Cost Estimation

The cost-benefit analysis methodology is based on *User Benefit Analysis For Highways Manual*, which is also referred to as *Red Book*, published by American Association of State Highway and Transportation Officials (AASHTO) in August 2003. The original construction, preliminary engineering, right-of-way (ROW) and utility costs of each project are estimated by ROW and Utility Cost Estimation Tool (RUCEST) and Construction Estimation Tool (CES) developed by Georgia Department of Transportation (GDOT) in 2008. The user benefit calculation reflects the benefit enjoyed by travelers directly affected by a transportation project and is determined by comparing travel time, operating, and accidents before and after a project is implemented. An Excel-based tool called *Redbook Wizard* disseminated by AASHTO along with the *Red Book* was utilized to organize project information and calculate the user benefits and costs of each highway improvement project.

### Project Assignments

Projects were identified across the region. **Figure 1** illustrates the locations.

Figure 1: Infrastructural Improvement Project Locations



## Policy or Design Strategies

### Introduction

Identification of policies and strategies should reflect the importance of the ASTROMAP System as part of the critical regional freight transportation network. The ASTROMAP network of roadways interacts regularly with other significant systems guiding freight movement through the region. As such, this network promotes access to roadways incorporated in other significant systems; NHS intermodal connectors, intermodal rail yards, Hartsfield-Jackson International airport and limited access highways.

### Context Sensitive Solutions

Proposed projects in this study will have positive impacts on travel performance but will also incorporate context sensitivity features to mitigate impact on policies and values of the existing communities. Potential policy recommendations may help designated roadways appropriately enhance communities or at minimum reduce impact of strengthening truck routes. A policy strategy recommended to enhance community sensitivity and general quality of life is Context Sensitive Design.

Due to the complexity of the study area, potential impacts to the built and natural environment, and differing values and views from the public and stakeholders, potential roadway projects should be completed using context sensitive solutions. Context sensitivity preserves and enhances community and natural environments. By thinking beyond the pavement, solutions can be implemented that not only accomplish mobility objectives, but also respect and enhance both the natural and built environments.

Context sensitivity requires that the transportation facility roadway work in harmony with, and not against, the natural and built environments. Understanding the role of the transportation facility and getting it “right” to move people, and not just cars, is one of the basic tenets of Context Sensitive Solutions. Keys to context sensitivity success include:

- A collaborative, vision-driven and stakeholder-led design process
- Education of planning partners regarding nationally-accepted design guidelines
- A holistic understanding of the relationship between land use and transportation, and the expertise in developing balanced transportation systems while successfully meshing transportation and land use elements

Context Sensitive Solutions is a process that facilitates cooperation among stakeholders and jurisdictions to ensure a design that naturally fits surroundings. Appropriate CSS strategies will assure local communities that preservation of facilities will be accomplished in a meaningful and thoughtful manner. To successfully implement freight planning in the Atlanta region, CSS strategies are recommended.

## Environmental Justice and Health Considerations<sup>1</sup>

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<sup>1</sup> The contents of this section were submitted to ARC by Rebecca Watts Hull, representing Mothers & Others for Clean Air with input from the Freight Committee of the Southeast Diesel Collaborative (SEDC), coordinated by EPA Region 4 and including Georgia Environmental Protection Division, Air Branch on April 16, 2010.

Truck and rail movements contribute to the introduction of particulate matter, nitrogen oxides, and other identified green house gases along roadways. As roadways are designated and promoted as truck routes, this impact is further increased as truck traffic levels increase disproportionately when compared to non-designated roadways.

Described in the document, Jurisdictional Environmental Justice, located on the ARC website, an area to be considered when evaluating future roadways for inclusion or land use designations is where populations reflect greater than average concentrations of young or elderly individuals. Each of these, younger persons less than 11 years of age and elderly, greater than 65 years of age, are disproportionately affected by these emissions. A review of the locations of schools, elderly centers, day cares, and outdoor recreational areas, where each of these groups may congregate, should be evaluated. A method for consideration of the presence of these groups is noted in the document, Criteria Matrix, located on the ARC website.

As the physical properties of the designated corridors within the ASTROMAP system are improved, through design or construction, these may attract greater commuter and general public traffic, in addition to focusing truck traffic. This condition is typical of traffic patterns. The general driving public should be educated as to the possible harmful effects of higher levels of exposure on truck designated routes. These possibly elevated conditions should be positioned as part of the permitting and zoning application process for future schools, day care centers, and other such facilities that place high concentrations of population adjacent to the roadway.

As the region is impacted by the presence of truck traffic and associated emissions resulting from past and current land use designations, three strategies may be applied to mitigate exposure to those groups:

- Roadway configuration: At-grade or above grade road surfaces lessen concentrations of harmful emissions versus below grade roadways
- Barriers: Vegetative and concrete barriers, placed roadside of truck routes possible reduce the transmission of roadway emissions to adjacent properties. Providing a benefit to roadside locations, these may concentrate emissions on the roadway and generate a negative effect on drivers.
- Emissions and Ambient Reduction: Placement of HVAC intakes of outside air into roadside buildings should be directed to draw from areas not adjacent to the roadway.

Continuance of community outreach and interaction activities related to the truck route may assist in identifying changing population and activity centers. By utilization of local community groups and education establishments, long term research may be possible and provide a steady stream of real-time observations along current and future truck corridors.

## Access Management

Exhaustively documented in both reference form and as a model ordinance for the guidance of local jurisdictions throughout the region, a coordinated approach and well documented access management strategy can significantly enhance the even flow of truck traffic along the ASTROMAP System. Communicated to those users of the ASTROMAP System, in both the

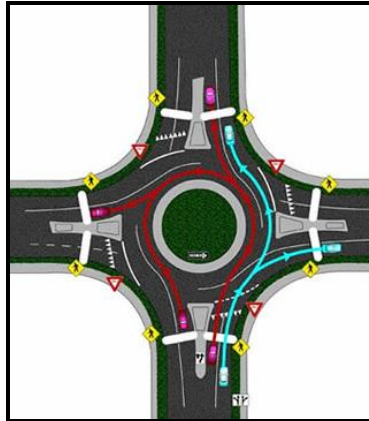


form of educational materials and in an implementation strategy can assist in the acceptance of and proper utilization of these practices by the truck driver. As a common and recognizable set of ordinances and construction criteria are presented to the truck driver, across the region, the private sector can actively designate route selection to coincide with these practices. Both the reference and model ordinance are available on the ARC website.

## Roundabout Designs and Implementation

### General Design

**Figure 2:** Example illustration of Roundabout Design



Source: 02/03/2010, [http://www.ci.watertown.mn.us/images/pics/roundabout\\_diagram\\_small.jpg](http://www.ci.watertown.mn.us/images/pics/roundabout_diagram_small.jpg)

Traditional intersections, with appropriately equipped signaling, continue to increase in cost and implementation. A less costly alternative for many agencies is initial placement or replacement with continuous flow intersections such as roundabout designs, example illustration **Figure 2**. Continuous flow intersections do not only facilitate traffic movement but they also are less expensive. Efficient truck movements are much better and more easily promoted through the creative use of continuous flow intersection. The operation of a truck in stop and go conditions costs travel time, wastes brakes and other equipment, creates environmental issues and exposes truck and surrounding vehicles to potential safety concerns. As a result, continuous flow intersections, creatively implemented would benefit trucking as well as the traveling public.

Roundabouts may be constructed in urban and rural conditions, as well as part of single or multiple lane roadways. Several jurisdictions are requiring studies be submitted that state why a roundabout should not be proposed instead of the traditional justification for imposing a roundabout in lieu of a traditional intersection. In a statement intended to guide future considerations and implementations of safety countermeasures, "...they should be considered as an alternative for all proposed new intersections on federally-funded highway projects..."<sup>2</sup> With adoption of a pro-roundabout strategy by state and local DOT's, the roundabout initially must overcome opposition by the driving public and the freight community. Trucking firms and drivers with preconceived concerns and experience with other similar designs such as traffic circles cite safety and access issues in opposition. Trucks that choose to avoid these designs elevate concerns by shippers that rates may increase and reduced coverage by trucking companies may occur; resulting in raised

<sup>2</sup> Memorandum, USDOT, FHWA, July 10, 2008, "ACTION: Considerations and Implementation of Proven Safety Countermeasures", Jeffery A. Lindley, Associate Administrator for Safety

transportation costs. It is important that to realize the benefits of steady and continuous flow of traffic and reduction of adverse safety conditions, design and education should be a priority.

As larger roundabout design may incorporate a greater right of way than traditional intersections, much design effort is geared to mitigate the cost and designs such as the mini-roundabout are applied. These have the capacity to accommodate large tractor-trailer combinations with appropriate planning and design. In either or combination of the designs, several solutions can be evaluated for construction. It is important to note that each supplemental “truck friendly” design strategy has compromises of efficiency and safety, for all traffic modes; truck, automobile, bike, and pedestrian.

### Truck Aprons

**Figure 3: Truck Apron**



Source: 02/03/2010, <http://www.ksdot.org/roundabouts/images/truck.jpg>

As vehicle length increases, the need to provide an expanded lane width during turning is necessary. Where truck traffic is expected, placement of truck aprons, road surface between the travel lanes and the landscape interior of larger roundabouts, accommodates the “trailing” movement of the trailer. To mitigate other vehicle usage and or abuse, and to identify the road surface as such, a different surface, such as pavers, concrete, etc is utilized, **Figure 3**. Striping that is recognizable by all drivers may also be used in tandem with surface changes. Without this added lane width, longer trucks will avoid the roundabout due to both equipment and cargo damage as a result of driving over elevated curb heights. Where this damage does occur, either alternative routing should be provided to commercial vehicles or continuing maintenance dollars can be expected to be repetitively required to reconstruct the curb and landscape.

### Traversable Islands

**Figure 4: Traversable Island Construction**



Source: 02/03/2010, [http://safety.fhwa.dot.gov/intersection/roundabouts/presentations/safety\\_aspects/long.cfm](http://safety.fhwa.dot.gov/intersection/roundabouts/presentations/safety_aspects/long.cfm)

In extremely space restricted areas such as roundabouts of other facilities, introducing islands, which may be driven over by trucks, while still directing automobile and other traffic in the traditional circular flow, is an accepted practice, **Figure 4**. Construction of this type is typically for intersections with lower truck volumes, as there is added wear on the materials used in the construction of the island. Islands may create a diminished rate of flow; because trucks must reduce speeds to reduce load shift and possible resulting cargo damage,

#### **Decision Sight Distance**

To accommodate multi-lane roundabout designs sufficient advance signing is required. Though discussed later in this report, as each lane proceeding into the roundabout is designed to accommodate a left or right turn or straight through traffic pattern, signage must be highly visible and provide the truck driver ample reaction time to select and then move to the appropriate lane, **Figure 5**.

Figure 5: Multi-lane Roundabout with Signage, VanDyke Blvd, Sterling Heights, MI



Source: Google Maps

### Education Documentation

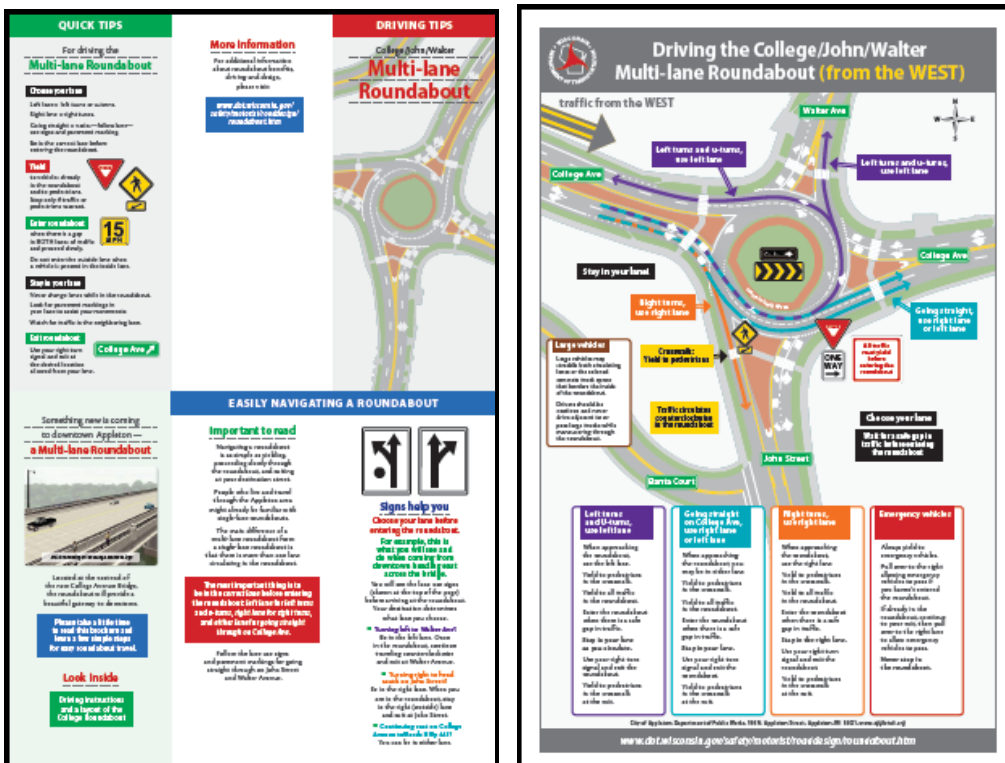
Where the roundabouts have been pursued, adverse opinions have existed as to the safety and the concern over proper use; affecting productivity of the vehicle using the roundabout. Two strategies to mitigate these concerns:

- How-to Guidebooks
- Safety Awareness

## “How To” Guides

Supplying driver-user friendly documentation to truck drivers at welcome centers, truck stops, and local facilities where truck operations exist can assist in the successful negotiation of roundabouts. State DOT’s, Wisconsin and Virginia among that group, have been instrumental in presenting written and visual education products for the driving public on the “why’s” and “how’s” of roundabout utilization. This process can easily be replicated at the MPO level. The City of Appleton, Wisconsin hosts location specific guides on roundabouts within their limits, **Figure 6**. These guides describe through graphics and verbiage the design and specific actions necessary to navigate. Targeting automobile traffic, notes and discussions of decision points related to truck traffic are noted as well.

Figure 6: Roundabout Education Brochure, Appleton WI



Source: 02/05/2010, <http://www.appleton.org/departments/public/traffic/roundabouts/files/CJW%20Brochure.pdf>

## Safety Related Statistics

Accident frequency rates and levels of severity have been proven to drop significantly as a result of roundabouts. Presentation within the brochures and online avenues mentioned previously can disseminate those figures. Posting of statistics in a manner that does not impair flow and safety but clearly advises truck users of roundabout benefits is an effective marketing tool. Truck driver communication consists of a great deal of one-on-one discussions over radios and at collection points, such as truck stops and places of work. An effective program relating safety, utilization methods, and efficiency metrics can reach a larger audience than simply those directly targeted, as a result.



## Signage Practices

The most common issue related to poor sign practices is the failure to provide adequate advance notice, for the truck driver to special considerations adjacent to or on the roadway and provide sufficient time for decision making. Each opportunity to communicate conditions to the truck driver requires increased separation between the vehicle and the event than the average automobile. Where conditions require alternatives, an additional consideration is that the truck driver must have adequate roadway and traffic interaction to remedy a poor decision.

Restricted or posted weight limits on bridges, left turn exits, prohibited routes and minimum vertical clearances are the more common scenarios faced by drivers unfamiliar with local road conditions. In each case where inadequate placement has reduced reaction time, once recognized, the driver is presented with either radical vehicle movement or continuing on, possibly into areas not “truck friendly”. The Manual on Uniform Traffic Control Devices (MUTCD) 2009 provides guidance not only for the type and size of signage, but also on placement. Section 2C.27 of the MUTCD discusses conditions and placement of the Low Clearance sign. Sub section 03 notes:

### **Section 2C.27 Low Clearance Signs (W12-2 and W12-2a)**

#### **Standard:**

- 01 **The Low Clearance (W12-2) sign (see Figure 2C-5) shall be used to warn road users of clearances less than 12 inches above the statutory maximum vehicle height.**

#### *Guidance:*

- 02 *The actual clearance should be displayed on the Low Clearance sign to the nearest 1 inch not exceeding the actual clearance. However, in areas that experience changes in temperature causing frost action, a reduction, not exceeding 3 inches, should be used for this condition.*
- 03 *Where the clearance is less than the legal maximum vehicle height, the W12-2 sign with a supplemental distance plaque should be placed at the nearest intersecting road or wide point in the road at which a vehicle can detour or turn around.*
- 04 *In the case of an arch or other structure under which the clearance varies greatly, two or more signs should be used as necessary on the structure itself to give information as to the clearances over the entire roadway.*
- 05 *Clearances should be evaluated periodically, particularly when resurfacing operations have occurred.*
- #### **Option:**
- 06 **The Low Clearance sign may be installed on or in advance of the structure. If a sign is placed on the structure, it may be a rectangular shape (W12-2a) with the appropriate legend (see Figure 2C-5).**

## Addressing At-Grade Rail Crossings

### Introduction

Safety and efficient flow of traffic, both general and truck specific, are two concerns directly related to at-grade rail crossings. Incidents occurring at crossings have remained constant in recent years, but nationally, the United States has among the highest amounts of incidents per year in the developed countries. Georgia is one of the top ten states in the nation for grade crossing collisions. In 2009, about nine percent of those collisions were trains colliding with semi-trailers.

With the total number of at-grade rail crossings within the region approximately 1,500 individual locations, these present a concern for flow and safety for truck movement throughout the region. A physical review of each site is beyond the scope of this project, yet assessing those directly influencing the ASTRoMaP system is imperative.

The review of these locations took place with physical assessment of those on or near the proposed ASTROMAP system and a data collection effort based on the Federal Rail Administration (FRA) publicly available database.



## Highway-Rail Grade Crossing Collisions

According to FRA statistics<sup>3</sup>, 1,880 highway-rail grade crossing collisions occurred in 2009. Approximately 61 percent of all Year 2009 highway-rail grade crossing collisions occurred in fifteen states including Georgia.

The Surface Transportation Act of 1987 established the Section 130 program. In 1991 Congress passed ISTEA which required that 10 percent of each state's STP funds be set aside for safety improvements under Sections 130 and 152 (Hazard Elimination).

Grade crossing signal projects are determined by a hazard ranking index using criteria developed by the Federal Railroad Administration's (FRA) and developed into an Accident Prediction Formula. Using the formula, GDOT develops a priority ranking for each crossing in the state and the highest ranked crossings are slated for signals until all 130 funding is allocated. A change in the criteria may dictate a crossing receive signals even though it's further down the list. The list is updated annually and any change in a crossing's statistics could move it up or down the list. A basic grade crossing installation - gates, lights, bells, and constant warning time currently costs about \$185,000.

Currently Georgia has 5,951 public at-grade highway-rail grade crossings of which 2,097 have gates, 244 have flashing lights only, and 3,610 have cross bucks only. There are 2,361 private at-grade crossings.

## Class I Railroads

Norfolk Southern (NS) and CSX, the two Class I railroads in the state, have Grade Crossing Safety Departments charged with eliminating redundant crossings, identifying corridors for signalization projects, and developing engineering solutions to improve safety at highway/rail grade crossings. Both railroads have funding allocated for those purposes and work closely with state and local governments in public/private partnerships to bring projects to fruition. For this project - Atlanta Regional Commission Proposed Truck Route Study - both railroads and GDOT have indicated a willingness to consider the route as a corridor. Local jurisdictions will need to be involved and no funding will be allocated towards quiet zones.

Current federal law requires train engineers to sound the locomotive horn when approaching a public at-grade crossing for not less than 15 seconds or more than 20 seconds. Quiet zones are designated track segments where train engineers are not required to sound the horn except in the case of an emergency. These segments must meet certain FRA criteria to compensate for the lack of a train horn so motorists' and the community's safety are not compromised.

## Short Line Railroads

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<sup>3</sup> Based on Preliminary 2009 Federal Railroad Administration Statistics, UPDATED 3/9/10

There are two short line railroads along the proposed truck route, Georgia Northeastern Railroad (GNRR) in Cherokee and Cobb Counties and Great Walton Railroad (GRWR) in Walton County. Both railroads operate trains as needed with no set schedule.

The GNRR operates from the GA/TN state line at Ellijay, GA, parallel to I-575 to Marietta. There are two to five trains daily depending on customers' needs and track speed is a maximum 15 mph. The railroad interchanges with the CSX in Marietta.

The GRWR operates one train daily from Social Circle, GA, to Monroe. Track speed is 10 mph. The railroad interchanges with CSX at Social Circle. The tracks parallel SR 11 and cross once just outside the Monroe city limits.

The most common danger associated with slow track speeds, under 30 mph, is that motorists are more likely to try to beat an approaching train over the crossing.

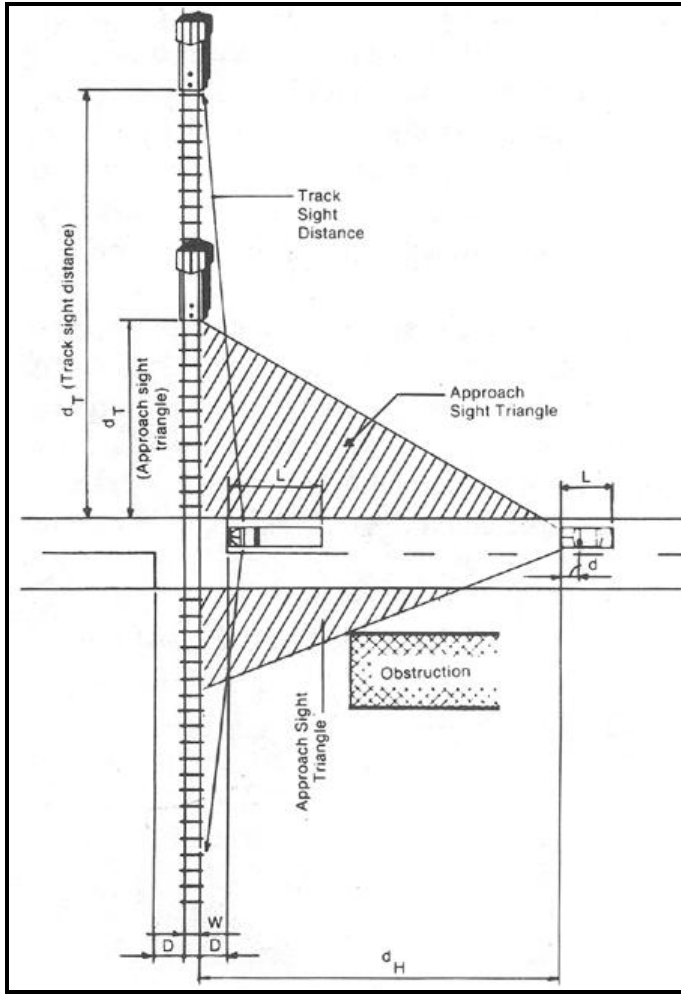
### Site Surveys

Crossings along the proposed truck route were assessed for grade separation possibilities, signalization, high profile ("humped back"), sight distance issues, signage, and closure possibilities.

It should be noted federal law requires railroads to pay five percent of grade separation costs (structure costs only) provided a signalized grade crossing is closed as a result of the grade separation.

Some states have laws governing the distance vegetation must be cleared from the crossing to provide sufficient sight distance for the motorist to see an approaching train. Currently Georgia does not have such a law. The DOT uses the sight distance triangle, **Diagram 1**, from the Grade Crossing Handbook as a guide. Sight distance is the correlation of vehicle speed, train speed, and the distance needed for the motorist to react to an approaching train based on those speeds, **Table 1**. Trucks are typically considered the slowest vehicle to cross the tracks after first stopping and proceeding in first gear.

**Diagram 1: Site Distance Triangle**



**Table 1: Site Distance Components**

Train speed (mph)	Case B: Departure from stop	Case A: Moving vehicle							
	Vehicle speed (mph)								
	0	10	20	30	40	50	60	70	80
	Distance along railroad from crossing, $d_r$ (feet)								
10	240	146	106	99	100	105	111	118	126
20	450	298	212	195	200	209	222	236	252
30	721	439	318	297	300	314	333	355	378
40	961	585	424	396	401	419	444	473	504
50	1201	782	580	494	501	524	555	591	630
60	1441	978	686	588	601	628	666	709	756
70	1681	1024	742	692	701	733	777	825	882
80	1921	1171	848	791	801	833	888	946	1008
90	2162	1317	954	890	901	943	999	1064	1134
	Distance along highway from crossing, $d_h$ (feet)								
		69	135	220	324	447	589	751	931

Source: A Policy on Geometric Design of Highway and Streets, 2004, by AASHTO

Surprisingly, there are few grade crossings actually crossing roadways on the proposed route and for the most part those crossings are located on low train traffic branch lines, industry tracks, or sidings. All of those crossings are signalized with gates, lights, bells, and, where necessary, cantilever signals.

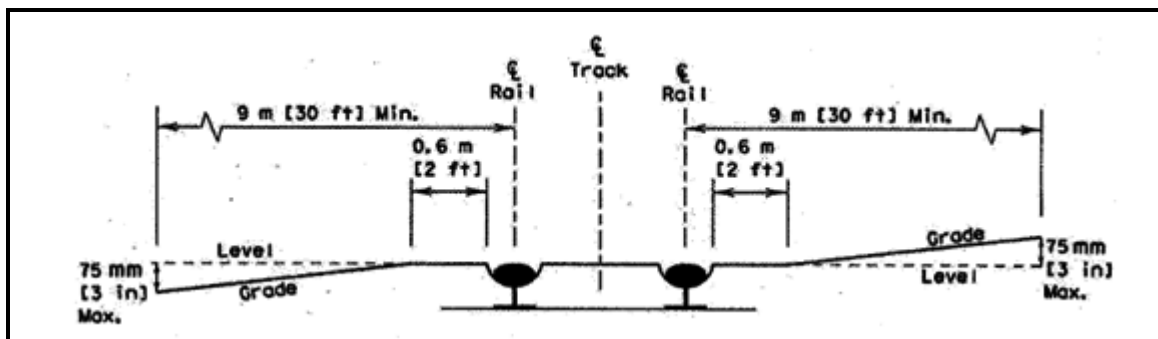
The largest percentage of grade crossings is located on tracks that parallel many of the proposed truck routes. The distance the tracks are located from the roadway varies from as little as 30' to 50' to several miles.

Locations where the tracks are within the 30' to 50' of the roadway create a unique set of problems. Truck drivers turning off the truck route onto a perpendicular street or into an industry or business should look in both directions for an approaching train. Drivers can generally see well in the direction of travel but to look in the opposite direction have to look over their shoulder and possibly turn their body to see properly depending on the angle the road crosses the tracks. All of the crossings surveyed were equipped with gates, lights, bells, and, where necessary, cantilevers. These active warning devices provide the driver with a visual and audible warning of an approaching train. Even so, drivers should not depend entirely on active warning devices.

Returning to the truck route from an industry or business the driver is on a perpendicular road making it easy to look in both directions for a train. However, the short queuing distance from the track to the intersecting roadway leaves the rear of the truck across the tracks. If ongoing traffic is sufficiently heavy and the driver cannot make an immediate turn, an oncoming train will not be able to stop in time and a collision will occur. One remedy is to create an acceleration lane for the driver turning right. Making a left turn would still be cause for concern. If the driver stops before crossing the tracks and proceeds when the way is clear, the fact he has to proceed from a complete stop requires more lead time to make the turn due to slow acceleration speed. Posting a Do Not Stop on the Tracks sign (R8-8) is suggested.

In many cases existing crossings are high profile crossings ("humped crossings"). The AREMA Manual for Railway Engineering "recommends that the crossing surface be in the same plane as the top of the rails for a distance of 600 millimeters (2 feet) outside of the rails, and that the surface of the highway be not more than 75 millimeters (2 inches) higher or lower than the top of the nearest rail at a point 7.5 meters (30 feet) from the rail, unless the track superelevation dictates otherwise." This is illustrated in **Diagram 2**. This policy has been adopted by AASHTO.

**Diagram 2: Humped Crossing Design Parameters**



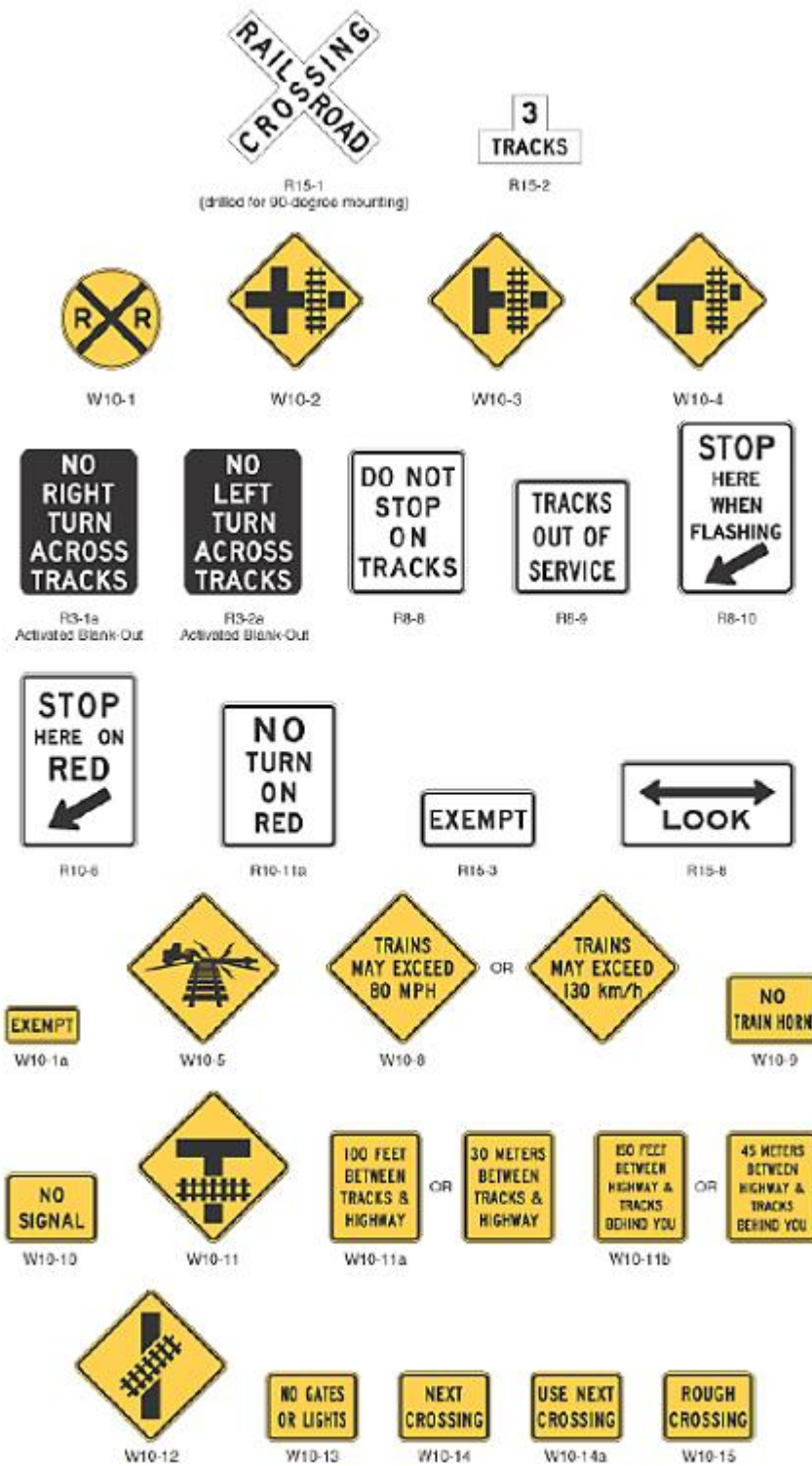
Trucks attempting to use high profile crossings risk getting hung up and struck by a train.

The Douglasville area has several of these crossings. The problem results from the different topography on each side of the track and is exacerbated by the short distance between the roadway and the track. The city has erected "humped crossing" signs (W10-5) alerting truck drivers to the problem and, in some cases, have even prohibited trucks from using certain crossings.

The Douglasville situation will be significantly rectified on completion of the SR 92 grade separation project. GDOT advises an estimated start date of 2014, and when completed will eliminate three existing grade crossings. McCarley St., DOT #726589M, is an example of a redundant crossing that should be closed now.

Rail crossing signage is diverse and allows for numerous warning messages to be transmitted to the vehicle operator, **Diagram 3**.

Diagram 3: MUTCD, 2008, Railroad Signage



The ideal situation is for land use planners and developers to locate industry and businesses where the tracks are not close to the roadway. Unfortunately there is already significant development along the proposed route where these short queuing distances exist.

### Locations of Parallel Tracks

Railroad	Road	County	Comments
CSX	SR 8/23	Barrow	Tracks parallel highway on the north side, close and far away. CSX Abbeville Sub mainline, track speed 10 mph, 2 trains daily
NS	SR 3	Clayton	Tracks parallel highway for about 2 miles, close and away. NS Mainline, track speed 25 mph, 17 trains daily.
NS	SR 8	Cobb	Tracks parallel highway in Austell. NS mainline, track speed for freight trains 60 mph, for AMTRAK 79, mph, 24 trains daily Austell to Birmingham, 107 trains daily Atlanta to Chattanooga.
NS	16E	Coweta	Tracks parallel highway on the south side at Carrollton and at Whitesburg run parallel on the north side, close and away. NS mainline, track speed 25 mph, 3 trains daily – Griffin to Cedartown
NS	SR 8/78	Douglas	Tracks parallel highway from Austell to Bremen, close and away. NS mainline, track speed for freight trains 60 mph, for AMTRAK 79 mph, 24 trains daily – Austell to Birmingham.
CSX	SR 8/29	Gwinnett Barrow	Tracks parallel highway from Winder to downtown Atlanta, close and away. Athens mainline, track speed 50 mph, 47 trains daily.
NS	SR 13/23	Gwinnett Hall	Tracks parallel highway from Gainesville to downtown Atlanta, close and away. NS Mainline, tracks speed for freight trains 60 mph, for AMTRAK 79 mph, 29 trains daily.
NS	SR 23	Butts Henry	Tracks parallel highway from Jackson to Interstate 285, close and away. NS mainline, track speed 25 mph, 17 trains daily.
CSX	SR 81	Newton	Tracks parallel highway in Covington then east along I-20 to downtown Atlanta. CSX mainline, track speed 50 mph, 17 trains daily.
CSX	SR 278	Rockdale	Track parallels highway in Conyers east along I-20 and Old Covington Highway to Covington. CSX mainline, track speed 50 mph, 21 trains daily.
NS	SR16	Spalding	Track parallels highway from Newnan to Griffin, close and away. NS mainline, track speed 26 mph, 17 trains a day – Atlanta to Macon S line.
CSX	SR 11	Walton	Tracks parallel highway from just west of Social circle to just east of downtown. GA line to Augusta, track speed 50 mph, 18 trains daily.
GRWR	SR 11	Walton	Tracks parallel highway from Social Circle to Monroe, close and far away. One train daily, track speed 10 mph, interchange with CSX at Social Circle.

NOTE-Close and far away indicate tracks are 30' to 50' from the roadway at some locations and 0.1 of a mile or more away at others. Crossings more than 0.5 miles from the designated truck route were not surveyed as they would not impact traffic.

## Crossings of Concern

Crossings listed in Table 12: Jurisdictionally Identified Railroad Crossings of Concern - were surveyed. With the exception of Jonesboro St. (SR 20), in McDonough, the crossings may impact local jurisdictions in terms of traffic patterns but have little or no impact on the actual proposed truck route with the exception of the safety concerns when tracks are located close to the roadway. Jurisdictions should contact the railroads' Grade Crossing Departments to develop engineering solutions and determine financial assistance available. NS' contact person is W. L. (Bill) Barringer in Atlanta, 404-582-5295. CSX contact is Cliff Stayton in Jacksonville, FL, 904-366-5049.

Jonesboro Road is the main route from I-75 into downtown McDonough. In mid-afternoon, traffic trying to move through town is slowed significantly because of the circular traffic pattern controlled by signals. Traffic can back up to NS' tracks approximately 0.4 mile west of downtown. Should a train pass during that time traffic in both directions is stopped with no relief until the train passes. A grade separation should be considered at this location. There is sufficient land west of the crossing but an engineering study would have to be conducted to determine if there is sufficient room to the east. There are two large, apparently historical homes, at the tracks that could be a factor but, again, an engineering study should find a solution.

Another possibility for an overpass is Buford Highway, DOT #717845C, in Gwinnett County. There is a small retail area where an overpass might be feasible. Those stores could be accessed from North Berkley Lake Rd.

Some closure possibilities were also noted: Cherokee St., DOT #3404428, Bartow County, Beulah St., DOT #3404428, Bartow County, and Mt. Tabor Rd., DOT #279657C, in Newton County. These locations would need more detailed study before suggesting to local government they be closed.

## Prioritizing At-Grade Crossings

The rail industry relies upon the Predictive Accident Rate assigned by the DOT to prioritize crossings for review. Developing a methodology by ARC participants may augment this by providing local jurisdictions with a ranking by which to propose crossing closures or upgrades for consideration.

The Federal Rail Administration (FRA) maintains an extensive database providing more than 50 specific identifying features for each crossing in the U.S. In Data File attachment A, all at-grade crossings are noted, by county, and 47 specific data tags are presented. Within these fields, fourteen were identified as complete fields in the database and extended to members and interested parties associated with the FATF and TCC. These were:

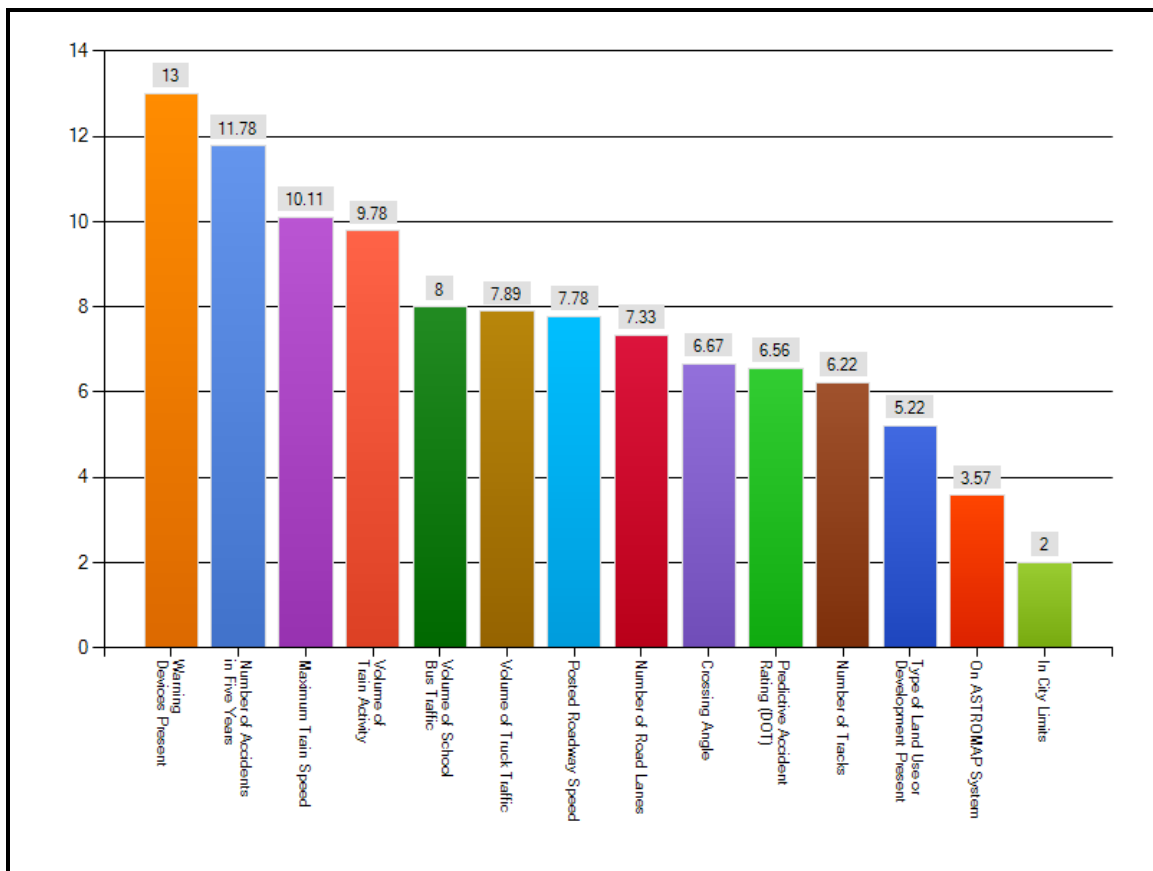
- Volume of Train Activity
- Volume of Truck Traffic
- Volume of School Bus Traffic
- Number of Tracks
- Number of Road Lanes
- Maximum Train Speed
- Posted Roadway Speed



- Predictive Accident Rating (DOT)
- Number of Accidents in Five Years
- Crossing Angle
- Warning Device Present
- Type of Land Use or Development Present
- In City Limits
- On ASTRoMaP System

Each invitee was requested to rank, by level of importance, each record field type to be considered for future action. As of March 31, 2010, of the 69 invitations, eight responses had been received; six public sector and two private sector. With a maximum score of 14, the survey revealed (see **Chart 1**) that the presence of warning devices dominated as most important.

**Chart 1: Rail Prioritization Survey Results**



Development of a standardized criteria matrix is complicated by location specific conditions. A significant measure is the advanced warning or queue established to trigger warning device activation. Triggering devices are programmed with a standard timing sequence that represents the type of train traffic most commonly associated with the track and to provide the most achievable safety conditions. As identified in the FRA database, minimum and maximum train speeds may vary by as few as ten miles per hour to as much as sixty-nine, for the region. The greater the range, the higher the probability that the warning will occur well in advance of a train. This variation introduces the variable more closely associated with at-grade crossing incidents; driver impatience. Crossings where

higher speed passenger service exists, signalization may be set to react to this faster closing rate on the crossing. Hence, when a slower moving freight train triggers the warning devices, motor vehicle operators may believe the warning device is faulty and begin to traverse the crossing. This condition leads to a high proportion of train-motor vehicle accidents.

DOT Predictive Accident Ratings, though scoring relatively low in the survey results, as stated previously, is the primary industry measure of prioritization. This rating, though variations exist, is founded on a basic formula, which for simplification, is composed of factors related to volumes of highway and train traffic, daylight train traffic, maximum train speeds, number of tracks, highway paving conditions at the crossing, and number of highway lanes. Many of the highest survey results were components of the Predictive Accident Rating; of the 14 components offered for consideration, numbers 2, 3, 4, 6, 8, and 10 are present in the rating. Daylight train activity and paving conditions are present in the attached data file provided by the FRA.

It is the recommendation of this study that the DOT Predictive Accident Rating be the basis for jurisdictional prioritization. This measure addresses six of the top nine (when excluding the Rating itself from the rankings) identified by the survey as local concerns and will provide a common ground of exchange with the private sector.

### Summary

After surveying the roadways on the proposed truck route it appears the movement of trucks will be affected when the driver turns off the designated route and has to cross the tracks. Frequency of train movements are predicted to increase, one report estimating by as much as 88 percent by 2035. The length of trains is also predicted to increase meaning there will be longer trains more often at existing highway/rail grade crossings.

The only way to avoid delays is to eliminate the crossings by constructing overpasses or underpasses. This would be especially helpful at rail yard locations where switching operations occur. As previously indicated, this is not always practical given the density of the area the cost of acquiring right-of-way and construction.

Closing a grade crossing is another alternative and may seem logical from an engineering perspective. This option almost always runs afoul of the public process. The local road authority and associated government body have to agree to the closure and pass a resolution accordingly. Both class I railroads and GDOT have incentive funds available to assist with closures and are willing to work with local governments to eliminate redundant crossings. In the event the local government refuses to agree to a closure, there is a state law, Code of Georgia, Section 32-6-193.1, which allows a railroad to petition the state to force the closure provided certain criteria are met. If this action is taken the local government loses any potential financial incentive.

Railroads were once the impetus for growth in communities but now are a dividing force both physically and politically. Trains provide delays, cause congestion, and are a concern during emergency response.

# PROJECTS

## Short, Medium Term

### NS-E0-01

<b>Route</b>	NS-E0
<b>Location</b>	City of Hapeville from Deerborn Plaza to Dogwood Drive on SR 3
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Narrow street and on-street parking presents a safety hazard for trucks
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Eliminate on-street parking and mitigate the existing parking. Widen the existing lanes.



**This project is identified as having positive cost-benefit, yet is not a recommendation.**

**It is important to consider projects of this type, where public conveyance, bike/pedestrian, and other considerations are important. Awareness of these cost-benefits should be compared to alternative solutions.**

Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E0-01	Narrow street and on-street parking presents a safety hazard for trucks	Widening	Fulton	CST	\$821,847.30	\$2,926,063.85	1.587
				PE	\$82,184.73		
				ROW	\$1,875,781.82		
				UTIL	\$146,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 239,456	\$ 1,612	\$ 1,960,910	\$ 14,962	\$ (36,904)	\$ -	\$ -	\$ 2,180,036	\$ -	\$ -
SR 3 at City of Hapeville	\$ 239,456	\$ 1,612	\$ 1,960,910	\$ 14,962	\$ (36,904)	\$ -	\$ -	\$ 2,180,036		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
	Improved				Improved			Improved		
All Segments	\$1,373,443	\$ -	\$ -	\$ -	\$ 806,592	\$ -	\$ -	1.587		
SR 3 at City of Hapeville	\$1,373,443	\$ -	\$ -	\$ -	\$ 806,592			1.587		

NS-E0-02

<b>Route</b>	NS-E0
<b>Location</b>	SR 3/Atlanta West Point Railroad bridge near University Ave.
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient railroad bridge clearance of 14'-6"
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Replace the railroad bridge or lower the roadway to increase the clearance to 16'-6"



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E0-02	Insufficient railroad bridge clearance of 14'-6"	Bridge replacement	Fulton	CST	\$2,486,484.00	\$3,775,930.88	0.169
				PE	\$248,648.40		
				ROW	\$1,016,048.48		
				UTIL	\$24,750.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 170,342	\$ 952	\$ 241,035	\$ (10,255)	\$ (40,993)	\$ -	\$ -	\$ 361,080	\$ -
SR 3 near University Ave.	\$ 170,342	\$ 952	\$ 241,035	\$ (10,255)	\$ (40,993)	\$ -	\$ -	\$ 361,080	
Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio		
All Segments	\$2,140,676	\$ -	\$ -	\$ (1,779,596)	\$ -	\$ -	0.169		
SR 3 near University Ave.	\$2,140,676	\$ -	\$ -	\$ (1,779,596)			0.169		

NS-E0-03

<b>Route</b>	NS-E0
<b>Location</b>	Intersection SR 9/Grassland Pkwy
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Trucks encroaching on the intersection shoulder
<b>Proposed Actions</b>	Interim Solution: Increase size of intersection radii
	Long-term Solution: Increase size of intersection radii, add right-turn lane on SR 9 southbound



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E0-03	Trucks encroaching on the intersection shoulder	Intersection Improvement	Forsyth	CST	\$71,467.87	\$267,655.31	14.58
				PE	\$7,146.79		
				ROW	\$97,540.65		
				UTIL	\$91,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 114,695	\$ 772	\$ 2,081,199	\$ (10,352)	\$ (71,450)	\$ -	\$ -	\$ 2,114,864	\$ -	\$ -
SR 9 and Grassland Pkwy	\$ 114,695	\$ 772	\$ 2,081,199	\$ (10,352)	\$ (71,450)	\$ -	\$ -	\$ 2,114,864		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	Improved			Improved			Improved			
All Segments	\$ 145,049	\$ -	\$ -	\$ 1,969,815	\$ -	\$ -	14.580			
SR 9 and Grassland Pkwy	\$ 145,049	\$ -	\$ -	\$ 1,969,815			14.580			

NS-E0-04

<b>Route</b>	NS-E0
<b>Location</b>	Intersection SR 9/Bethany Bend
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Southbound trucks encroaching on the intersection shoulder
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Increase size of southbound right turn intersection radius and add right-turn lane



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E0-04	Intersection SR 9/Bethany Bend	Intersection Improvement	Fulton	CST	\$52,226.46	\$181,228.82	33.025
				PE	\$5,222.65		
				ROW	\$71,279.71		
				UTIL	\$52,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 71,908	\$ 484	\$ 3,194,218	\$ (10,358)	\$ (58,096)	\$ -	\$ -	\$ 3,198,155	\$ -	\$ -
SR 9 and Bethany Bend	\$ 71,908	\$ 484	\$ 3,194,218	\$ (10,358)	\$ (58,096)	\$ -	\$ -	\$ 3,198,155		
	Capital Costs				Net Benefits			Benefit-Cost Ratio		
Segment	Improved			Improved			Improved			
All Segments	\$ 96,839	\$ -	\$ -	\$ 3,101,316	\$ -	\$ -	33.025			
SR 9 and Bethany Bend	\$ 96,839	\$ -	\$ -	\$ 3,101,316			33.025			



NS-E0-05

<b>Route</b>	NS-E0
<b>Location</b>	Intersection SR 9/Old Milton Pkwy
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on southbound inside-lane
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add double left turn-lanes or replace signalized intersection with a continuous flow intersection (roundabout)



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E0-05	Traffic backups on southbound inside-lane	Intersection Improvement	Fulton	CST	\$161,514.47	\$511,255.25	10.1
				PE	\$16,151.45		
				ROW	\$204,964.33		
				UTIL	\$128,625.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 314,335	\$ 2,116	\$ 2,553,183	\$ (10,412)	\$ (110,177)	\$ -	\$ -	\$ 2,749,045	\$ -	\$ -
SR 9 and Old Milton Pkwy	\$ 314,335	\$ 2,116	\$ 2,553,183	\$ (10,412)	\$ (110,177)	\$ -	\$ -	\$ 2,749,045		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	Improved				Improved			Improved		
SR 9 and Old Milton Pkwy	\$ 272,172	\$ -	\$ -	\$ -	\$ 2,476,874	\$ -	\$ -	10.100		

NS-E0-06

<b>Route</b>	NS-E0
<b>Location</b>	Intersection SR 9/I-285
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on northbound and southbound inside-lane on the overpass bridge over I-285
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen bridge over I-285 and lengthen left turn lanes



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E0-06	Traffic backups on northbound and southbound inside-lane on the overpass bridge over I-285	Bridge widening	Fulton	CST	\$4,167,820.80	\$8,753,322.88	8.078
				PE	\$416,782.08		
				ROW	\$4,126,720.00		
				UTIL	\$42,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 907,809	\$ 6,110	\$35,556,843	\$ (10,479)	\$ (124,583)	\$ -	\$ -	\$ 36,335,701	\$ -	\$ -
SR 9 and I-285	\$ 907,809	\$ 6,110	\$35,556,843	\$ (10,479)	\$ (124,583)	\$ -	\$ -	\$ 36,335,701		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	Improved			Improved			Improved			
All Segments	\$4,497,992	\$ -	\$ -	\$ 31,837,709	\$ -	\$ -	8.078			
SR 9 and I-285	\$4,497,992	\$ -	\$ -	\$ 31,837,709			8.078			



NS-E1-03

<b>Route</b>	NS-E1
<b>Location</b>	SR 13/ N 34° 04'
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient Shoulder Width over Stream Crossing
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen shoulder and add guardrail

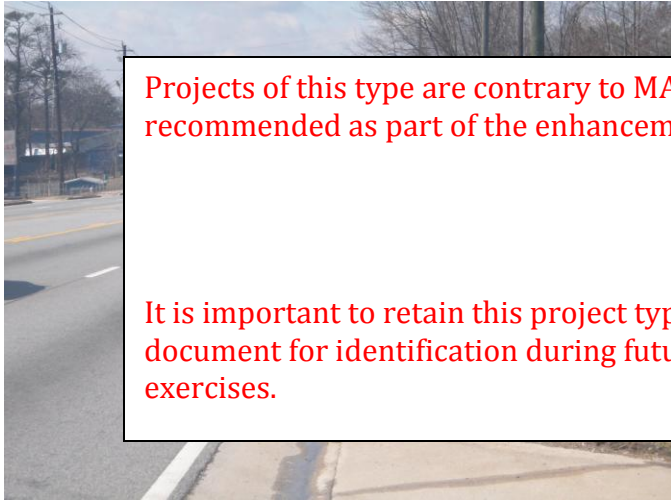


Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-03	Insufficient Shoulder Width over Stream Crossing	Widening	Hall	CST	\$244,396.95	\$439,961.56	2.193
				PE	\$24,439.70		
				ROW	\$102,874.91		
				UTIL	\$68,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 203,779	\$ 1,372	\$ 367,121	\$ (10,710)	\$ (34,914)	\$ -	\$ -	\$ 526,647	\$ -	\$ -
SR 13	\$ 203,779	\$ 1,372	\$ 367,121	\$ (10,710)	\$ (34,914)	\$ -	\$ -	\$ 526,647		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	\$ 240,107	\$ -	\$ -	\$ 286,540	\$ -	\$ -	\$ 2.193			
SR 13	\$ 240,107	\$ -	\$ -	\$ 286,540			2.193			

NS-E1-04

<b>Route</b>	NS-E1
<b>Location</b>	SR 13/ N 33°55.85' W 84°13.74'
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Bus stop at this location both north and southbound obstructs the right lane impeding the movement of traffic.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add turnout lane for bus stop



Projects of this type are contrary to MARTA policy and are thus not recommended as part of the enhancement project set for ASTROMAP.

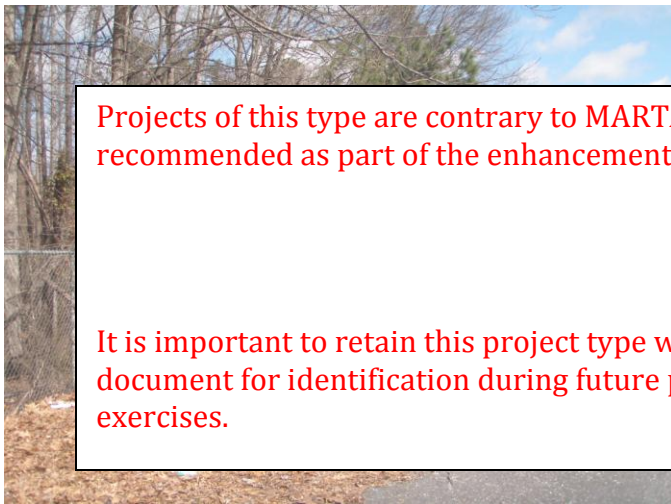
It is important to retain this project type within the confines of this document for identification during future project identification exercises.

Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-04	Bus stop at this location both north and southbound obstructs the right lane impeding the movement of traffic.	Widening	Hall	CST	\$128,630.03	\$872,621.82	0.944
				PE	\$12,863.00		
				ROW	\$683,878.79		
				UTIL	\$47,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 163,677	\$ 1,007	\$ 394,895	\$ (10,824)	\$ (23,276)	\$ -	\$ -	\$ 525,480	\$ -
SR 13 and Gaines Ferry Road	\$ 163,677	\$ 1,007	\$ 394,895	\$ (10,824)	\$ (23,276)	\$ -	\$ -	\$ 525,480	
Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio		
All Segments	Improved			Improved			Improved		
All Segments	\$ 282,479	\$ -	\$ -	\$ 243,001	\$ -	\$ -	1.860		
SR 13 and Gaines Ferry Road	\$ 282,479	\$ -	\$ -	\$ 243,001			1.860		

NS-E1-05

<b>Route</b>	NS-E1
<b>Location</b>	North of Intersection SR 13/ Dresden Drive
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Bus stops at this location both north and southbound obstruct the right lane impeding the movement of traffic.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add turnout lane for bus stops



Projects of this type are contrary to MARTA policy and are thus not recommended as part of the enhancement project set for ASTROMAP.

It is important to retain this project type within the confines of this document for identification during future project identification exercises.

Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-05	Bus stops at this location both north and southbound obstruct the right lane impeding the movement of traffic	Turn lane	DeKalb	CST	\$203,009.52	\$1,828,461.99	2.497
				PE	\$20,300.95		
				ROW	\$1,563,151.52		
				UTIL	\$42,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 163,677	\$ 1,007	\$ 394,895	\$ (10,824)	\$ (23,276)	\$ -	\$ -	\$ 525,480	\$ -
SR 13 and Gaines Ferry Road	\$ 163,677	\$ 1,007	\$ 394,895	\$ (10,824)	\$ (23,276)	\$ -	\$ -	\$ 525,480	
Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio		
All Segments	Improved			Improved			Improved		
All Segments	\$ 282,479	\$ -	\$ -	\$ 243,001	\$ -	\$ -	1.860		
SR 13 and Gaines Ferry Road	\$ 282,479	\$ -	\$ -	\$ 243,001			1.860		

NS-E1-06

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/Browns Mill Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 155 northbound
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Lengthen right turn lane



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-06	Traffic backups on SR 155 northbound	Turn lane	DeKalb	CST	\$108,805.34	\$496,784.60	15.599
				PE	\$10,880.53		
				ROW	\$311,848.73		
				UTIL	\$65,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 578,642	\$ 3,019	\$ 3,169,097	\$ (10,605)	\$ (75,768)	\$ -	\$ -	\$ 3,664,385	\$ -
SR 155 and Browns M	\$ 578,642	\$ 3,019	\$ 3,169,097	\$ (10,605)	\$ (75,768)	\$ -	\$ -	\$ 3,664,385	\$ -
	<b>Capital Costs</b>				<b>Net Benefits</b>			<b>Benefit-Cost Ratio</b>	
Segment	Improved			Improved			Improved		
All Segments	\$ 234,918	\$ -	\$ -	\$ 3,429,468	\$ -	\$ -	15.599		
SR 155 and Browns M	\$ 234,918	\$ -	\$ -	\$ 3,429,468			15.599		

NS-E1-07

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/East Fairview Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 155 northbound & southbound
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Lengthen left turn lane



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-07	Intersection SR 155/East Fairview Road	Turn lane	Henry	CST	\$230,212.75	\$673,691.45	2.681
				PE	\$23,021.28		
				ROW	\$310,207.42		
				UTIL	\$110,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
<b>All Segments</b>	\$ 158,004	\$ 1,063	\$ 883,888	\$ (9,894)	\$ (27,627)	\$ -	\$ -	\$ 1,005,434	\$ -	\$ -
SR 155 and Fairview f	\$ 158,004	\$ 1,063	\$ 883,888	\$ (9,894)	\$ (27,627)	\$ -	\$ -	\$ 1,005,434	\$ -	\$ -
	<b>Capital Costs</b>				<b>Net Benefits</b>			<b>Benefit-Cost Ratio</b>		
<b>All Segments</b>	Improved				Improved			Improved		
All Segments	\$ 375,045	\$ -	\$ -	\$ 630,389	\$ -	\$ -	\$ -	2.681		
SR 155 and Fairview f	\$ 375,045	\$ -	\$ -	\$ 630,389				2.681		

NS-E1-08

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/Camp Creek Drive
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 155 southbound, insufficient sight distance on SR 155 SB approaching this intersection
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add Southbound left turn lane



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-08	Traffic backups on SR 155 southbound, insufficient sight distance on SR 155 SB approaching this intersection	Turn lane	Henry	CST	\$115,715.53	\$269,786.78	3.52
				PE	\$11,571.55		
				ROW	\$74,249.70		
				UTIL	\$68,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 80,889	\$ 544	\$ 494,395	\$ (10,771)	\$ (28,129)	\$ -	\$ -	\$ 536,928	\$ -	\$ -
SR 155 Camp Creek I	\$ 80,889	\$ 544	\$ 494,395	\$ (10,771)	\$ (28,129)	\$ -	\$ -	\$ 536,928		
	<b>Capital Costs</b>				<b>Net Benefits</b>			<b>Benefit-Cost Ratio</b>		
Segment	Improved				Improved			Improved		
All Segments	\$ 152,516	\$ -	\$ -	\$ 384,412	\$ -	\$ -	\$ -	3.520		
SR 155 Camp Creek I	\$ 152,516	\$ -	\$ -	\$ 384,412				3.520		



NS-E1-09

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/Ashley Oaks Drive/Pinnacle Lane
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 155 northbound & southbound, insufficient sight distance on SR 155 NB approaching this intersection
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add left-turn lanes



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-09	Traffic backups on SR 155 northbound & southbound, insufficient sight distance on SR 155 NB approaching this intersection	Turn lane	Henry	CST	\$115,715.53	\$237,311.99	5.569
				PE	\$11,571.55		
				ROW	\$22,274.91		
				UTIL	\$87,750.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
<b>All Segments</b>	\$ 108,691	\$ 732	\$ 747,931	\$ (10,612)	\$ (36,804)	\$ -	\$ -	\$ 809,939	\$ -
SR 155 and Ashley O:	\$ 108,691	\$ 732	\$ 747,931	\$ (10,612)	\$ (36,804)	\$ -	\$ -	\$ 809,939	\$ -
	<b>Capital Costs</b>				<b>Net Benefits</b>			<b>Benefit-Cost Ratio</b>	
<b>Segment</b>	<b>Improved</b>				<b>Improved</b>			<b>Improved</b>	
<b>All Segments</b>	\$ 145,442	\$ -	\$ -	\$ 664,496	\$ -	\$ -	\$ 5,569		
SR 155 and Ashley O:	\$ 145,442	\$ -	\$ -	\$ 664,496			5.569		

**NS-E1-10**

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/Capwelch Drive
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 155 northbound
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add northbound left-turn lane



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-10	Traffic backups on SR 155 northbound	Turn lane	Henry	CST	\$115,715.53	\$212,243.26	1.16
				PE	\$11,571.55		
				ROW	\$16,706.18		
				UTIL	\$68,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
<b>All Segments</b>	\$ 155,633	\$ 1,048	\$ 50,424	\$ (10,395)	\$ (44,876)	\$ -	\$ -	\$ 151,833	\$ -	\$ -
SR 155 and Capwelch	\$ 155,633	\$ 1,048	\$ 50,424	\$ (10,395)	\$ (44,876)	\$ -	\$ -	\$ 151,833	\$ -	\$ -
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
	Improved				Improved			Improved		
<b>All Segments</b>	\$ 130,922	\$ -	\$ -	\$ 20,911	\$ -	\$ -	\$ -	1.160		
SR 155 and Capwelch	\$ 130,922	\$ -	\$ -	\$ 20,911				1.160		



**NS-E1-11**

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/SR 42
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Trucks encroaching on the curbs and shoulders, high level of congestion
<b>Proposed Actions</b>	Interim Solution: Increase radii on all four intersection approaches
	Long-term Solution: Replace signal with a continuous flow intersection (roundabout)



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-11	Trucks encroaching on the curbs and shoulders, high level of congestion	Roundabout	Henry	CST	\$764,360.01	\$1,011,188.90	5.674
				PE	\$76,436.00		
				ROW	\$117,892.89		
				UTIL	\$52,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
<b>All Segments</b>	\$ 115,997	\$ 781	\$ 3,406,860	\$ (10,761)	\$ (30,436)	\$ -	\$ -	\$ 3,482,441	\$ -
SR 155 and SR 42	\$ 115,997	\$ 781	\$ 3,406,860	\$ (10,761)	\$ (30,436)	\$ -	\$ -	\$ 3,482,441	\$ -
	<b>Capital Costs</b>				<b>Net Benefits</b>			<b>Benefit-Cost Ratio</b>	
<b>Segment</b>	<b>Improved</b>				<b>Improved</b>			<b>Improved</b>	
<b>All Segments</b>	\$ 613,708	\$ -	\$ -	\$ 2,868,733	\$ -	\$ -	\$ -	5.674	
SR 155 and SR 42	\$ 613,708	\$ -	\$ -	\$ 2,868,733				5.674	

NS-E1-12

<b>Route</b>	NS-E1
<b>Location</b>	Intersection SR 155/Jackson Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on all four approaches, trucks encroaching on the shoulders.
<b>Proposed Actions</b>	Interim Solution: Increase radii on all four intersection approaches
	Long-term Solution: Replace four-way stop with a roundabout



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E1-12	Traffic backups on all four approaches, trucks encroaching on the shoulders.	Roundabout	Spalding	CST	\$764,360.01	\$938,519.23	6.791
				PE	\$76,436.00		
				ROW	\$29,473.22		
				UTIL	\$68,250.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 7,070	\$ 48	\$ 4,029,652	\$ (10,331)	\$ (15,627)	\$ -	\$ -	\$ 4,010,812	\$ -
SR 155 and Jackson F	\$ 7,070	\$ 48	\$ 4,029,652	\$ (10,331)	\$ (15,627)	\$ -	\$ -	\$ 4,010,812	\$ -
Capital Costs				Net Benefits			Benefit-Cost Ratio		
Segment	Improved			Improved			Improved		
All Segments	\$ 590,568	\$ -	\$ -	\$ 3,420,244	\$ -	\$ -	6.791		
SR 155 and Jackson F	\$ 590,568	\$ -	\$ -	\$ 3,420,244	\$ -	\$ -	6.791		

NS-E2-02

<b>Route</b>	NS-E2
<b>Location</b>	SR 20/I-20 Interchange
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 20 is a six-lane section on the north and south side of the overpass bridge over I-20. SR 20 transitions to a four-lane section prior to the I-20 bridge resulting in excessive congestion on the overpass bridge over I-20.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen the bridge over I-20 to provide double left-turn lanes and provide six thru lanes across the bridge.



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E2-02	Excessive congestion on the overpass bridge over I-20.	Bridge Widening	Rockdale	CST	\$9,077,640.00	\$11,659,925.21	16.926
				PE	\$907,764.00		
				ROW	\$1,653,521.21		
				UTIL	\$21,000.00		

Segment	User Benefits from Operation				User Benefits from Construction		Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved		Improved		
All Segments	\$ (571,651)	\$ (4,606)	\$ 119,186,371	\$ 33,357	\$ (167,728)	\$ -	\$ -	\$ 118,475,743	\$ -
SR 20 over I-20	\$ (571,651)	\$ (4,606)	\$ 119,186,371	\$ 33,357	\$ (167,728)	\$ -	\$ -	\$ 118,475,743	
	Capital Costs				Net Benefits		Benefit-Cost Ratio		
Segment	Improved		Improved		Improved				
All Segments	\$ 6,999,479	\$ -	\$ -	\$ 111,476,264	\$ -	\$ -	16.926		
SR 20 over I-20	\$ 6,999,479	\$ -	\$ -	\$ 111,476,264			16.926		

NS-E3-01

<b>Route</b>	NS-E3
<b>Location</b>	SR 81 over Snapping Shoals Creek, N33°29.37' W83°57.31'
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient shoulder width on bridge
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution:
	Widen shoulder by replacing or widening bridge



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E3-01	Insufficient shoulder width on bridge	Bridge Widening	Newton	CST	\$2,587,200.00	\$3,190,050.30	0.235
				PE	\$258,720.00		
				ROW	\$312,630.30		
				UTIL	\$31,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 60,556	\$ 408	\$ 201,454	\$ 102,915	\$ (10,111)	\$ -	\$ -	\$ 355,222	\$ -
SR 81 over Snapping Shoals Cree	\$ 60,556	\$ 408	\$ 201,454	\$ 102,915	\$ (10,111)	\$ -	\$ -	\$ 355,222	
Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio		
	Improved			Improved			Improved		
All Segments	\$ 1,509,158	\$ -	\$ -	\$ (1,153,937)	\$ -	\$ -	0.235		
SR 81 over Snapping Shoals Cree	\$ 1,509,158	\$ -	\$ -	\$ (1,153,937)			0.235		

NS-E4-03

<b>Route</b>	NS-E4
<b>Location</b>	Intersection SR 11/SR 211
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Intersection is a four-way stop.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Signalize intersection



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E4-03	Intersection is a four-way stop	Intersection Improvement	Barrow	CST	\$125,000.00	\$148,000.00	62.205
				PE	\$12,500.00		
				ROW	\$0.00		
				UTIL	\$10,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 73,866	\$ 382	\$ 5,762,937	\$ 60,517	\$ (28,705)	\$ -	\$ -	\$ 5,868,997	\$ -	\$ -
SR 11 and SR 211	\$ 73,866	\$ 382	\$ 5,762,937	\$ 60,517	\$ (28,705)	\$ -	\$ -	\$ 5,868,997		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
	Improved			Improved			Improved			
All Segments	\$ 94,349	\$ -	\$ -	\$ 5,774,648	\$ -	\$ -	62.205			
SR 11 and SR 211	\$ 94,349	\$ -	\$ -	\$ 5,774,648			62.205			

NS-E4-04

<b>Route</b>	NS-E4
<b>Location</b>	Intersection SR 11/US 29BR
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Intersection has significant congestion and insufficient radius.
<b>Proposed Actions</b>	Interim Solution: Increase radius
	Long-term Solution: Increase radius and add right-turn lanes on all four approaches.



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E4-04	Intersection has significant congestion and insufficient radius.	Intersection Improvement	Barrow	CST	\$22,906.00	\$69,643.87	4.556
				PE	\$2,290.60		
				ROW	\$23,447.27		
				UTIL	\$21,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 108,297	\$ 560	\$ 116,057	\$ (10,354)	\$ (40,299)	\$ -	\$ -	\$ 174,261	\$ -
SR 11 and US 29	\$ 108,297	\$ 560	\$ 116,057	\$ (10,354)	\$ (40,299)	\$ -	\$ -	\$ 174,261	
	Capital Costs				Net Benefits			Benefit-Cost Ratio	
Segment	Improved			Improved			Improved		
All Segments	\$ 38,248	\$ -	\$ -	\$ 136,013	\$ -	\$ -	4.556		
SR 11 and US 29	\$ 38,248	\$ -	\$ -	\$ 136,013			4.556		



NS-E4-05

<b>Route</b>	NS-E4
<b>Location</b>	SR 11 Bridge at Barrow/Walton County Line
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient shoulder width on bridge
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen shoulder by replacing or widening bridge



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-E4-05	Insufficient shoulder width on bridge	Bridge Widening	Barrow	CST	\$8,895,744.00	\$10,172,390.40	0.138
				PE	\$889,574.40		
				ROW	\$315,072.00		
				UTIL	\$72,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 486,612	\$ 2,516	\$ 433,774	\$ (10,346)	\$ (26,844)	\$ -	\$ -	\$ 885,712	\$ -
SR 11 Bridge at Barrow/Walton Cc	\$ 486,612	\$ 2,516	\$ 433,774	\$ (10,346)	\$ (26,844)	\$ -	\$ -	\$ 885,712	
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio	
	Improved				Improved			Improved	
All Segments	\$ 6,402,176	\$ -	\$ -	\$ (5,516,464)	\$ -	\$ -		0.138	
SR 11 Bridge at Barrow/Walton Cc	\$ 6,402,176	\$ -	\$ -	\$ (5,516,464)				0.138	



NS-W1-01

<b>Route</b>	NS-W1
<b>Location</b>	Intersection SR 92/CSXT Railroad in Union City
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 92 is an underpass with a 10' vertical clearance at this location. This prohibits the movement of trucks on this route
<b>Proposed Actions</b>	Interim Solution: Do nothing
	<p>Long-term Solution:</p> <p>Option #1: Redirect trucks approximately 1000 ft to the south of this crossing to the Senoia Rd at-grade crossing over CSXT Railroad then direct traffic along E. Broad Street to SR 92.</p> <p>Option #2: Redirect traffic to SR 138 to Oakley Industrial Blvd then to SR 92. Add Oakley Industrial Blvd to the State Route system. Remove the portion of SR 92 that crosses the CSXT Railroad in downtown Union City from the state route system.</p>

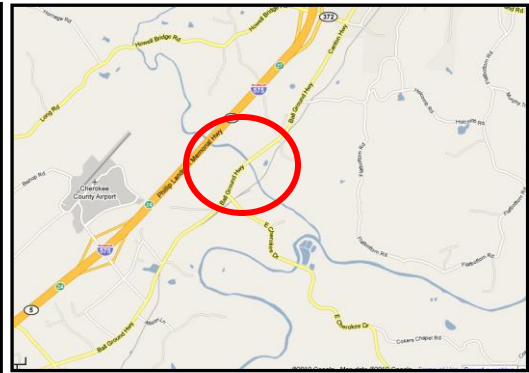


Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-W1-01	SR 92 is an underpass with a 10' vertical clearance	Reroute	Fulton	CST	N/A	N/A	N/A
				PE	N/A		
				ROW	N/A		
				UTIL	N/A		

CBA Non-applicable

NS-W1-02

<b>Route</b>	NS-W1
<b>Location</b>	Bridge on Ball Ground Hwy over Sharp Mountain Creek just south of Ball Ground
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Bridge width
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Replace bridge



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-W1-02	Bridge width	Bridge Replacement	Cherokee	CST	\$4,553,472	\$5,156,395.26	0.06
				PE	\$455,347.20		
				ROW	\$62,526.06		
				UTIL	\$85,050		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 161,669	\$ 965	\$ 59,533	\$ (11,102)	\$ (14,656)	\$ -	\$ -	\$ 196,409	\$ -	\$ -
Ball Ground Hwy	\$ 161,669	\$ 965	\$ 59,533	\$ (11,102)	\$ (14,656)	\$ -	\$ -	\$ 196,409		
Capital Costs				Net Benefits			Benefit-Cost Ratio			
Segment	Improved			Improved			Improved			
All Segments	\$ 3,270,755	\$ -	\$ -	\$ (3,074,346)	\$ -	\$ -	\$ 0.060			
Ball Ground Hwy	\$ 3,270,755	\$ -	\$ -	\$ (3,074,346)			0.060			

NS-W1-03

<b>Route</b>	NS-W1
<b>Location</b>	Widen bridge over combined rail and water located on GA 280 at the transition from S. Cobb Dr and James Jackson Parkway.
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Bridge width
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen bridge



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-W1-03	Bridge width	Bridge Widening	Cobb	CST	\$4,003,084.80	\$6,086,121.46	0.512
				PE	\$400,308.48		
				ROW	\$1,557,778.18		
				UTIL	\$124,950		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 934,921	\$ 5,582	\$ 890,720	\$ (10,234)	\$ (44,203)	\$ -	\$ -	\$ 1,776,786	\$ -	\$ -
GA-280	\$ 934,921	\$ 5,582	\$ 890,720	\$ (10,234)	\$ (44,203)	\$ -	\$ -	\$ 1,776,786		
Capital Costs				Net Benefits			Benefit-Cost Ratio			
Segment	Improved			Improved			Improved			
All Segments	\$ 3,471,340	\$ -	\$ -	\$ (1,694,554)	\$ -	\$ -	\$ 0.512			
GA-280	\$ 3,471,340	\$ -	\$ -	\$ (1,694,554)			0.512			

NS-W2-04

<b>Route</b>	NS-W2
<b>Location</b>	Intersection SR 92/Broad Street
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient radius for turning trucks
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Move utilities located near edge of pavement and increase pavement radius



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-W2-04	Insufficient radius for turning trucks	Intersection Improvement	Douglas	CST	\$108,805.34	\$369,410.42	2.102
				PE	\$10,880.53		
				ROW	\$191,974.55		
				UTIL	\$57,750.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 134,911	\$ 805	\$ 299,948	\$ (10,402)	\$ (36,037)	\$ -	\$ -	\$ 389,225	\$ -
SR 92 and Broad Street	\$ 134,911	\$ 805	\$ 299,948	\$ (10,402)	\$ (36,037)	\$ -	\$ -	\$ 389,225	
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio	
All Segments	Improved			Improved			Improved		
All Segments	\$ 185,152	\$ -	\$ -	\$ 204,073	\$ -	\$ -	2.102		
SR 92 and Broad Street	\$ 185,152	\$ -	\$ -	\$ 204,073			2.102		

NS-W2-05

<b>Route</b>	NS-W2
<b>Location</b>	Intersection SR 8/SR 92
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Northbound SR 92 right-turn movements do not have adequate turning radius
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Increase intersection radius



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-W2-05	Northbound SR 92 right-turn movements do not have adequate turning radius	Intersection Improvement	Douglas	CST	\$59,556.56	\$415,449.34	1.914
				PE	\$5,955.66		
				ROW	\$254,012.12		
				UTIL	\$95,925.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 153,696	\$ 918	\$ 299,486	\$ (10,267)	\$ (64,375)	\$ -	\$ -	\$ 379,458	\$ -
SR 92 and SR 8	\$ 153,696	\$ 918	\$ 299,486	\$ (10,267)	\$ (64,375)	\$ -	\$ -	\$ 379,458	
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio	
All Segments	Improved				Improved			Improved	
SR 92 and SR 8	\$ 198,234	\$ -	\$ -	\$ -	\$ 181,224	\$ -	\$ -	1.914	



NS-W2-06

<b>Route</b>	NS-W2
<b>Location</b>	Intersection SR 154/SR 14
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 154 southbound. Right turning traffic encroaches on the shoulder due to the lack of a right-turn lane
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add a right-turn lane



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
NS-W2-06	Traffic backups on SR 154 southbound. Right turning traffic encroaches on the shoulder due to the lack of a right-turn lane	Turn lane	Fulton	CST	\$114,531.87	\$1,084,875.97	4.808
				PE	\$11,453.19		
				ROW	\$937,890.91		
				UTIL	\$21,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 1,527,282	\$ 9,118	\$ 713,992	\$ (10,430)	\$ (97,210)	\$ -	\$ -	\$ 2,142,752	\$ - \$ -
SR 154 and SR 14	\$ 1,527,282	\$ 9,118	\$ 713,992	\$ (10,430)	\$ (97,210)	\$ -	\$ -	\$ 2,142,752	
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio	
	Improved				Improved			Improved	
All Segments	\$ 445,651	\$ -	\$ -	\$ 1,697,102	\$ -	\$ -	4.808		
SR 154 and SR 14	\$ 445,651	\$ -	\$ -	\$ 1,697,102			4.808		

EW-N1-01

<b>Route</b>	EW-N1
<b>Location</b>	SR 8/I-285 Interchange
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Excessive backups on SR 8 westbound left-turn movement
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen bridge over I-285 and add a double left-turn lane on SR 8 westbound onto I-285. Widen I-285 southbound on-ramp from one lane to two lanes



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N1-01	Excessive backups on SR 8 westbound left-turn movement	Bridge widening	DeKalb	CST	\$2,178,633.60	\$6,033,745.44	0.641
				PE	\$217,863.36		
				ROW	\$3,595,248.48		
				UTIL	\$42,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 620,275	\$ 4,175	\$ 1,330,581	\$ (10,303)	\$ (82,181)	\$ -	\$ -	\$ 1,862,545	\$ -	\$ -
SR 8 and SR 285	\$ 620,275	\$ 4,175	\$ 1,330,581	\$ (10,303)	\$ (82,181)	\$ -	\$ -	\$ 1,862,545		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
	Improved				Improved			Improved		
All Segments	\$ 2,903,657	\$ -	\$ -	\$ (1,041,112)	\$ -	\$ -		0.641		
SR 8 and SR 285	\$ 2,903,657	\$ -	\$ -	\$ (1,041,112)				0.641		



EW-N1-02

<b>Route</b>	EW-N1
<b>Location</b>	Intersection SR 8/Conners Rd
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient turning radius and right-turn lane for westbound traffic on SR 8
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add a right-turn lane and increase radius at intersection

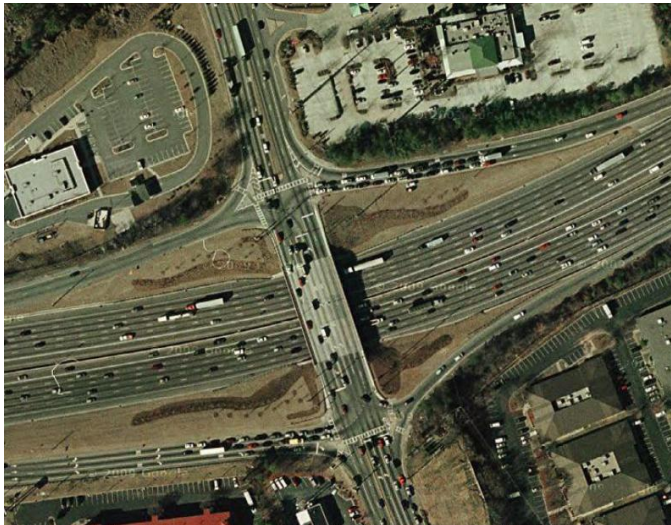


Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N1-02	Insufficient turning radius and right-turn lane for westbound traffic on SR 8	Turn lane	Douglas	CST	\$65,512.22	\$204,437.99	1.788
				PE	\$6,551.22		
				ROW	\$111,374.55		
				UTIL	\$21,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 61,399	\$ 413	\$ 150,303	\$ (9,950)	\$ (21,393)	\$ -	\$ -	\$ 180,772	\$ -	\$ -
SR 8 and Conners Road	\$ 61,399	\$ 413	\$ 150,303	\$ (9,950)	\$ (21,393)	\$ -	\$ -	\$ 180,772		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	\$ 101,121	\$ -	\$ -	\$ 79,651	\$ -	\$ -	1.788			
SR 8 and Conners Road	\$ 101,121	\$ -	\$ -	\$ 79,651			1.788			

**EW-N2-01**

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 140/I-85
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Excessive backups resulting from the left turn movement from SR 140 to the entrance ramps to I-85
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Reconfigure this interchange to a Diverging Interchange configuration.



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-01	Excessive backups resulting from the left turn movement from SR 140 to the entrance ramps to I-85	Bridge reconfiguration	Gwinnett	CST	\$4,000,000.00	\$4,738,998.79	43.019
				PE	\$400,000.00		
				ROW	\$296,998.79		
				UTIL	\$42,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 1,610,717	\$ 9,617	\$125,172,803	\$ (10,505)	\$ (170,325)	\$ -	\$ -	\$126,612,307	\$ -	\$ -
SR 140 and I-85	\$ 1,610,717	\$ 9,617	\$125,172,803	\$ (10,505)	\$ (170,325)	\$ -	\$ -	\$126,612,307		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	\$ 2,943,182	\$ -	\$ -	\$ -	\$123,669,125	\$ -	\$ -	43.019		
SR 140 and I-85	\$ 2,943,182	\$ -	\$ -	\$ -	\$123,669,125			43.019		

EW-N2-03

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 316/SR 81
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 316 has significant backups on the eastbound and westbound approaches at this intersection
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Replace this at-grade intersection with a diamond interchange



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-03	SR 316 has significant backups on the eastbound and westbound approaches at this intersection	Interchange	Barrow	CST	\$15,000,000.00	\$18,907,727.27	43.019
				PE	\$1,500,000		
				ROW	\$2,344,727.27		
				UTIL	\$63,000.00		

Segment	User Benefits from Operation				User Benefits from Construction		Total User Benefits Improved	
	User Value of	User Oper	User Accident Red	Agency Opera	Improved	Improved	Improved	Improved
All Segments	\$ 3,717,137	\$ 25,019	\$ 8,603,728	\$ (10,642)	\$(80,761)	\$ -	\$ -	\$ 12,254,482
SR 316 and SR 81	\$ 3,717,137	\$ 25,019	\$ 8,603,728	\$ (10,642)	\$(80,761)	\$ -	\$ -	\$ 12,254,482
Segment	Capital Costs			Net Benefits		Benefit-Cost Ratio		
	Improved			Improved		Improved	Improved	
All Segments	\$ 11,438,624	\$ -	\$ -	\$ 815,858	\$ -	-	1.071	
SR 316 and SR 81	\$ 11,438,624	\$ -	\$ -	\$ 815,858			1.071	

EW-N2-04

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 316/SR 324
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 316 has significant backups at this intersection
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Replace this at-grade intersection with a diamond interchange



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-04	SR 316 has significant backups at this intersection	Interchange	Barrow	CST	\$15,000,000.00	\$17,735,363.64	0.966
				PE	\$1,500,000.00		
				ROW	\$1,172,363.64		
				UTIL	\$63,000.00		

Segment	User Benefits from Operation			Agency Operating Benefits		User Benefits from Construction		Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Improved	Improved	Improved	Improved	Improved	Improved
All Segments	\$ 3,210,643	\$ 21,610	\$ 7,477,217	\$ (10,435)	\$(72,153)	\$ -	\$ -	\$ 10,626,883	\$ -
SR 316 and SR 324(Carl Bethlehem Road))	\$ 3,210,643	\$ 21,610	\$ 7,477,217	\$ (10,435)	\$(72,153)	\$ -	\$ -	\$ 10,626,883	\$ -
Segment	Capital Costs			Net Benefits		Benefit-Cost Ratio			
	Improved	Improved	Improved	Improved	Improved	Improved	Improved	Improved	Improved
All Segments	\$ 10,998,687	\$ -	\$ -	\$ (371,803)	\$ -	\$ -	\$ -	0.966	
SR 316 and SR 324(Carl Bethlehem Road))	\$ 10,998,687	\$ -	\$ -	\$ (371,803)	\$ -	\$ -	\$ -	0.966	

EW-N2-05

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 316/Patrick Mill Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 316 has significant backups on the eastbound and westbound approaches at this intersection
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Replace this at-grade intersection with a diamond interchange



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-05	SR 316 has significant backups on the eastbound and westbound approaches at this intersection	Interchange	Gwinnett	CST	\$15,000,000.00	\$21,252,454.55	1.005
				PE	\$1,500,000.00		
				ROW	\$4,689,454.55		
				UTIL	\$63,000.00		

Segment	User Benefits from Operation			Agency Operating Benefits	User Benefits from Construction		Total User Benefits
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits		Improved	Improved	
All Segments	\$ 3,741,835	\$ 25,186	\$ 8,708,549	\$ (10,215)	\$(81,378)	\$ -	\$ 12,383,977
SR 316 and Patrick Mill Road	\$ 3,741,835	\$ 25,186	\$ 8,708,549	\$ (10,215)	\$(81,378)	\$ -	\$ 12,383,977
Segment	Capital Costs			Net Benefits	Benefit-Cost Ratio		
All Segments	Improved			Improved		Improved	
All Segments	\$ 12,318,498	\$ -	\$ -	\$ 65,479	\$ -	-	1.005
SR 316 and Patrick Mill Road	\$ 12,318,498	\$ -	\$ -	\$ 65,479			1.005

EW-N2-06

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 316/Harbins Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 316 has significant backups on the eastbound and westbound approaches at this intersection
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Replace this at-grade intersection with a overpass bridge or diamond interchange



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-06	SR 316 has significant backups on the eastbound and westbound approaches at this intersection	Interchange	Gwinnett	CST	\$15,000,000.00	\$170,139,334.55	1.819
				PE	\$1,500,000.00		
				ROW	\$5,076,334.55		
				UTIL	\$63,000.00		

Segment	User Benefits from Operation			User Benefits from Construction		Total User Benefits
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved	Improved
All Segments	\$ 10,329,997	\$ 69,529	\$ 12,396,620	\$ (10,521)	\$ (113,804)	\$ -
SR 316 and Harbins Road	\$ 10,329,997	\$ 69,529	\$ 12,396,620	\$ (10,521)	\$ (113,804)	\$ -
	<b>Capital Costs</b>			<b>Net Benefits</b>		<b>Benefit-Cost Ratio</b>
<b>Segment</b>	<b>Improved</b>			<b>Improved</b>		<b>Improved</b>
All Segments	\$ 12,463,677	\$ -	\$ -	\$ 10,208,145	\$ -	1.819
SR 316 and Harbins Road	\$ 12,463,677	\$ -	\$ -	\$ 10,208,145	\$ -	1.819



EW-N2-07

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 316/SR 8
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 316 has significant backups on the eastbound and westbound approaches at this intersection, westbound left turn lane is insufficient in length, insufficient radii, vehicles encroaching on the shoulders
<b>Proposed Actions</b>	Interim Solution: Extend westbound left turn lane, increase radii, and add acceleration lanes.
	Long-term Solution: Replace this at-grade intersection with a diamond interchange



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-07	SR 316 has significant backups on the eastbound and westbound approaches at this intersection, westbound left turn lane is insufficient in length, insufficient radii, vehicles encroaching on the shoulders	Interchange	Gwinnett	CST	\$15,000,000	\$21,252,454.55	3.973
				PE	\$1,500,000.00		
				ROW	\$4,689,454.55		
				UTIL	\$63,000.00		

Segment	User Benefits from Operation			User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved	Improved	Improved	Improved
All Segments	\$ 33,577,015	\$ 226,001	\$ 15,280,800	\$ (10,337)	\$ (131,536)	\$ -	\$ -	\$ 48,941,943
SR 316 and SR 8	\$ 33,577,015	\$ 226,001	\$ 15,280,800	\$ (10,337)	\$ (131,536)	\$ -	\$ -	\$ 48,941,943
<b>Segment</b>	<b>Capital Costs Improved</b>			<b>Net Benefits Improved</b>		<b>Benefit-Cost Ratio Improved</b>		
All Segments	\$ 12,318,498	\$ -	\$ -	\$ -	\$ 36,623,445	\$ -	-	3.973
SR 316 and SR 8	\$ 12,318,498	\$ -	\$ -	\$ -	\$ 36,623,445	-	-	3.973



EW-N2-08

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 124/SR 8
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 8 transitions from a four-lane roadway to a two-lane roadway and remains a two-lane road to the intersection of SR 8/SR 316. This section of roadway has excessive congestion.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen this three mile section of roadway from two lanes to four lanes



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-08	This section of roadway has excessive congestion.	Widening	Gwinnett	CST	\$15,632,057.84	\$31,438,747.86	6.271
				PE	\$1,563,205.78		
				ROW	\$11,759,784.24		
				UTIL	\$2,483,700.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 30,248,421	\$ 203,597	\$ 75,972,124	\$ (10,531)	\$ (66,052)	\$ -	\$ -	\$106,347,558	\$ - \$ -
SR 124 and SR 8	\$ 30,248,421	\$ 203,597	\$ 75,972,124	\$ (10,531)	\$ (66,052)	\$ -	\$ -	\$106,347,558	
	Capital Costs				Net Benefits			Benefit-Cost Ratio	
Segment	Improved			Improved			Improved		
All Segments	\$ 16,958,080	\$ -	\$ -	\$ 89,389,478	\$ -	\$ -	6.271		
SR 124 and SR 8	\$ 16,958,080	\$ -	\$ -	\$ 89,389,478			6.271		

EW-N2-09

<b>Route</b>	EW-N2
<b>Location</b>	Intersection SR 8/Hosea Rd
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Insufficient radii which causes trucks to encroach into the left turn lanes and the shoulders
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Increase intersection radii



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N2-09	Insufficient radii which causes trucks to encroach into the left turn lanes and the shoulders	Intersection Improvement	Gwinnett	CST	\$45,812.69	\$90,151.78	5.815
				PE	\$4,581.27		
				ROW	\$18,757.82		
				UTIL	\$21,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 120,109	\$ 808	\$ 264,128	\$ (10,334)	\$ (69,110)	\$ -	\$ -	\$ 305,600	\$ - \$ -
SR 8 and Hosea Road	\$ 120,109	\$ 808	\$ 264,128	\$ (10,334)	\$ (69,110)	\$ -	\$ -	\$ 305,600	
	Capital Costs				Net Benefits			Benefit-Cost Ratio	
Segment	Improved				Improved			Improved	
All Segments	\$ 52,551	\$ -	\$ -	\$ 253,049	\$ -	\$ -	5.815		
SR 8 and Hosea Road	\$ 52,551	\$ -	\$ -	\$ 253,049			5.815		

EW-N4-01

<b>Route</b>	EW-N4
<b>Location</b>	Intersection SR 20/West Broad St/Sycamore Rd
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Congestion on SR 20 westbound
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add left turn lane on SR 20 westbound



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N4-01	Traffic backups on SR 20	Intersection Improvement	Gwinnett	CST	\$458,127.00	\$693,708.79	16.18
				PE	\$45,812.70		
				ROW	\$158,269.09		
				UTIL	\$31,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 24,922	\$ 190	\$ 7,075,955	\$ (10,317)	\$ (69,034)	\$ -	\$ -	\$ 7,021,716	\$ -	\$ -
SR 20 and Suwannee Dam Road	\$ 24,922	\$ 190	\$ 7,075,955	\$ (10,317)	\$ (69,034)	\$ -	\$ -	\$ 7,021,716		
Segment	Capital Costs			Improved	Net Benefits			Benefit-Cost Ratio		
All Segments	\$ 433,972	\$ -	\$ -	\$ 6,587,744	\$ -	\$ -	\$ 16.180			
SR 20 and Suwannee Dam Road	\$ 433,972	\$ -	\$ -	\$ 6,587,744			16.180			

EW-N4-02

<b>Route</b>	EW-N4
<b>Location</b>	Intersection SR 20/Suwannee Dam Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups on SR 20 on the eastbound and westbound approaches
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add right turn-lanes on the eastbound and westbound approaches.



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N4-02	Traffic backups on SR 20	Intersection Improvement	Gwinnett	CST	\$458,127.00	\$693,708.79	16.18
				PE	\$45,812.70		
				ROW	\$158,269.09		
				UTIL	\$31,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 24,922	\$ 190	\$ 7,075,955	\$ (10,317)	\$ (69,034)	\$ -	\$ -	\$ 7,021,716	\$ - \$ -
SR 20 and Suwannee Dam Road	\$ 24,922	\$ 190	\$ 7,075,955	\$ (10,317)	\$ (69,034)	\$ -	\$ -	\$ 7,021,716	
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio	
All Segments	\$ 433,972	\$ -	\$ -	\$ 6,587,744	\$ -	\$ -	16.180		
SR 20 and Suwannee Dam Road	\$ 433,972	\$ -	\$ -	\$ 6,587,744			16.180		

EW-N4-03

<b>Route</b>	EW-N4
<b>Location</b>	SR 20 bridge over the Chattahoochee River
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	The bridge is narrow with substandard shoulder widths.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Widen bridge to include standard shoulder widths.



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N4-03	The bridge is narrow with substandard shoulder widths	Intersection Improvement	Gwinnett	CST	\$2,312,893.00	\$3,527,133.12	0.927
				PE	\$231,289.30		
				ROW	\$766,725.82		
				UTIL	\$216,225.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 32,399	\$ 247	\$ 1,943,854	\$ (10,317)	\$ (69,034)	\$ -	\$ -	\$ 1,897,149	\$ -	\$ -
SR 20 bridge over Chattahoochee	\$ 32,399	\$ 247	\$ 1,943,854	\$ (10,317)	\$ (69,034)	\$ -	\$ -	\$ 1,897,149		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
	Improved				Improved			Improved		
All Segments	\$ 2,047,451	\$ -	\$ -	\$ (150,303)	\$ -	\$ -	0.927			
SR 20 bridge over Chattahoochee	\$ 2,047,451	\$ -	\$ -	\$ (150,303)			0.927			

EW-N4-04

<b>Route</b>	EW-N4
<b>Location</b>	SR 20/US 411 Interchange (Cartersville)
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	The entrance ramp from SR 20 to US 411 is a one-way stop. No acceleration lane is provided.
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add an acceleration lane and widen the bridge over the CSX railroad to accommodate the acceleration lane.



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-N4-04	The entrance ramp from SR 20 to US 411 is a one-way stop. No acceleration lane is provided.	Ramp widening	Bartow	CST	\$97,477.65	\$564,744.24	21.848
				PE	\$9,747.77		
				ROW	\$225,093.82		
				UTIL	\$232,425.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 12,061	\$ 108	\$ 6,618,323	\$ (10,627)	\$ (43,678)	\$ -	\$ -	\$ 6,576,185	\$ - \$ -
SR 20 and US 411	\$ 12,061	\$ 108	\$ 6,618,323	\$ (10,627)	\$ (43,678)	\$ -	\$ -	\$ 6,576,185	
	Capital Costs				Net Benefits			Benefit-Cost Ratio	
Segment	Improved			Improved			Improved		
All Segments	\$ 300,991	\$ -	\$ -	\$ 6,275,194	\$ -	\$ -	21.848		
SR 20 and US 411	\$ 300,991	\$ -	\$ -	\$ 6,275,194			21.848		



**EW-S1-01**

<b>Route</b>	EW-S1
<b>Location</b>	SR 138/SR 279
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Traffic backups in the right lane on SR 138 westbound
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add a right turn-lane



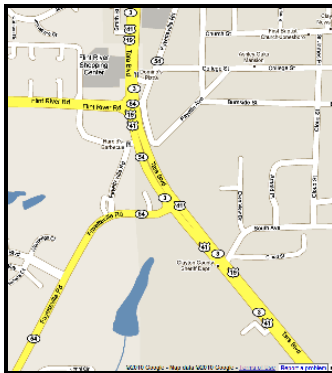
Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-S1-01	Traffic backups in the right lane on SR 138 westbound	Turn lane	Fulton	CST	\$114,531.87	\$412,207.79	34.3
				PE	\$11,453.19		
				ROW	\$234,472.73		
				UTIL	\$51,750.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 5,249	\$ 40	\$ 6,973,355	\$ (10,518)	\$ (63,766)	\$ -	\$ -	\$ 6,904,361	\$ -	\$ -
SR 138 and SR 279	\$ 5,249	\$ 40	\$ 6,973,355	\$ (10,518)	\$ (63,766)	\$ -	\$ -	\$ 6,904,361		
Segment	Capital Costs				Net Benefits			Benefit-Cost Ratio		
All Segments	\$ 201,291	\$ -	\$ -	\$ 6,703,069	\$ -	\$ -	\$ 34.300			
SR 138 and SR 279	\$ 201,291	\$ -	\$ -	\$ 6,703,069			34.300			



**EW-S2-01**

<b>Route</b>	EW-S2
<b>Location</b>	Improve geometrics associated with eastbound flow on EW-S2 and a southbound turn from EW-S2 onto NS-E0.
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Intersection geometrics
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Improve intersection radii



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-S2-01	Intersection turning radii	Intersection Improvements	Clayton	CST	\$230,611.08	\$704,570.74	13.520
				PE	\$23,061.10		
				ROW	\$356,398.55		
				UTIL	\$94,500		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 2,941,280	\$ 17,560	\$ 2,010,697	\$ (10,480)	\$ (150,030)	\$ -	\$ -	\$ 4,809,026	\$ -	\$ -
GA-54/GA-3	\$ 2,941,280	\$ 17,560	\$ 2,010,697	\$ (10,480)	\$ (150,030)	\$ -	\$ -	\$ 4,809,026		
Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio			
All Segments	\$ 355,697	\$ -	\$ -	\$ 4,453,329	\$ -	\$ -	Improved	13.520		
GA-54/GA-3	\$ 355,697	\$ -	\$ -	\$ 4,453,329				13.520		

EW-S3-02

<b>Route</b>	EW-S3
<b>Location</b>	Intersection SR 16/SR 5
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	This intersection is a substandard designed roundabout. Trucks entering this intersection are incapable of performing left turns
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Reconstruct this roundabout to current design standards that allow left-turn movements for trucks



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
EW-S3-02	This intersection is a substandard designed roundabout. Trucks entering this intersection are incapable of performing left turns	Roundabout	Carroll	CST	\$594,666.02	\$1,125,040.77	0.323
				PE	\$59,466.60		
				ROW	\$454,408.15		
				UTIL	\$16,500.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 2,821	\$ 17	\$ 231,320	\$ (10,194)	\$ (30,838)	\$ -	\$ -	\$ 193,126	\$ -
SR 16 and SR 5	\$ 2,821	\$ 17	\$ 231,320	\$ (10,194)	\$ (30,838)	\$ -	\$ -	\$ 193,126	
	Capital Costs				Net Benefits			Benefit-Cost Ratio	
Segment	Improved			Improved			Improved		
All Segments	\$ 598,041	\$ -	\$ -	\$ (404,915)	\$ -	\$ -	0.323		
SR 16 and SR 5	\$ 598,041	\$ -	\$ -	\$ (404,915)			0.323		

**CNS-WD-01**

<b>Route</b>	CNS-WD at NS-W1
<b>Location</b>	Improve geometrics associated with the intersection of GA-74 and GA-85
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Intersection geometrics
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Improve intersection



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
CNS-WD-01	Intersection turning radii	Intersection Improvements	Fayette	CST	\$181,342.07	\$388,926.16	1.534
				PE	\$18,134.20		
				ROW	\$29,699.88		
				UTIL	\$159,750		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits		
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved		
All Segments	\$ 228,616	\$ 1,365	\$ 183,773	\$ (10,627)	\$ (34,645)	\$ -	\$ -	\$ 368,482	\$ -	\$ -
GA-85/GA-74	\$ 228,616	\$ 1,365	\$ 183,773	\$ (10,627)	\$ (34,645)	\$ -	\$ -	\$ 368,482		

Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio	
	Improved			Improved			Improved	
All Segments	\$ 240,148	\$ -	\$ -	\$ 128,334	\$ -	\$ -	1.534	
GA-85/GA-74	\$ 240,148	\$ -	\$ -	\$ 128,334			1.534	

**Wesley-01**

<b>Route</b>	Wesley Chapel Road/I-20 Interchange
<b>Location</b>	I-20/Wesley Chapel Rd Interchange
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Excessive congestion on Wesley Chapel Rd
<b>Proposed Actions</b>	Interim Solution: The I-20 east bound off ramp has double right turn lanes with the right lane being a free flowing lane. Provide a signal head for the left right turn lane, separate the double right-turn lanes, improve signing and marking to indicate the right lane is free flowing.
	Long-term Solution: Option #1: In addition to the interim solution add a free flowing right turn lane on the I-20 westbound off ramp and extend the double lanes on the I-20 westbound on ramp. Option#2: Convert this diamond interchange to a diverging diamond interchange



Project ID	Concern	Project Type	County	Phase	Phase cost	Total Cost	Benefit cost ratio
Wesley Chapel Road/I-20 Interchange	Excessive congestion on Wesley Chapel Rd	Diverging Diamond Interchange	DeKalb	CST	\$3,000,000.00	\$4,368,785.45	1.416
				PE	\$300,000.00		
				ROW	\$984,785.45		
				UTIL	\$84,000.00		

Segment	User Benefits from Operation				User Benefits from Construction			Total User Benefits	
	User Value of Time Benefits	User Operating Cost Benefits	User Accident Reduction Benefits	Agency Operating Benefits	Improved			Improved	
All Segments	\$ 1,941,603	\$ 11,592	\$ 1,737,295	\$ (10,547)	\$ (100,782)	\$ -	\$ -	\$ 3,579,162	\$ -
I-20 and Wesley Chapel Road	\$ 1,941,603	\$ 11,592	\$ 1,737,295	\$ (10,547)	\$ (100,782)	\$ -	\$ -	\$ 3,579,162	
Segment	Capital Costs			Net Benefits			Benefit-Cost Ratio		
	Improved			Improved			Improved		
All Segments	\$ 2,526,814	\$ -	\$ -	\$ 1,052,348	\$ -	\$ -	1.416		
I-20 and Wesley Chapel Road	\$ 2,526,814	\$ -	\$ -	\$ 1,052,348			1.416		

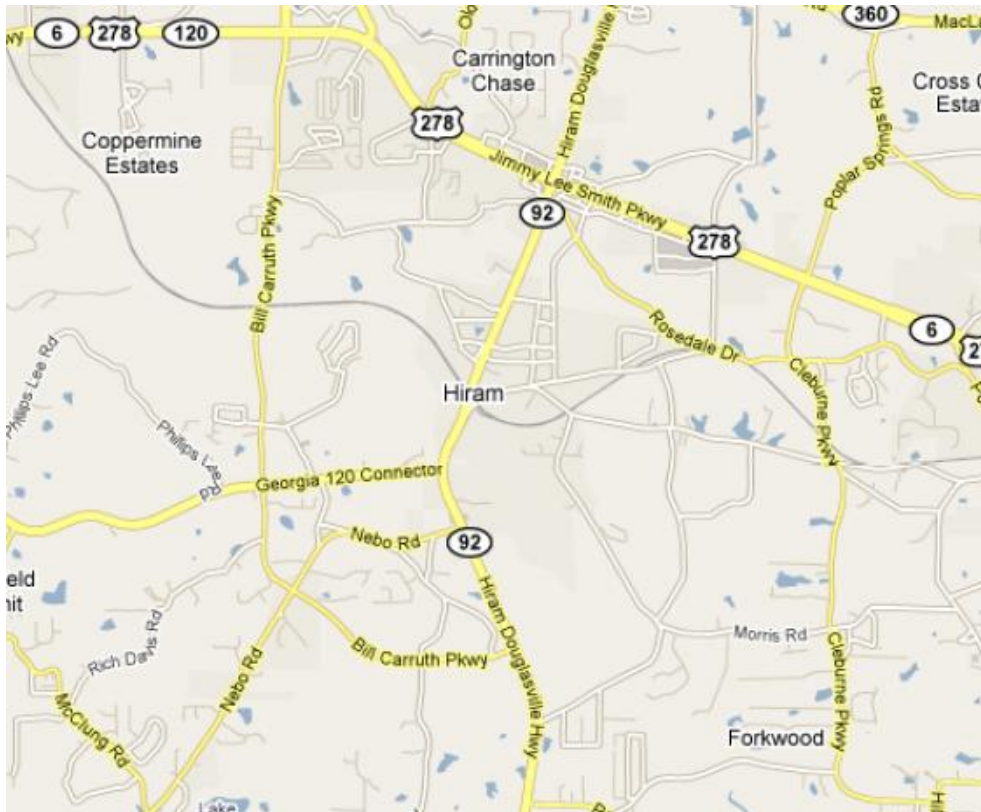
## Capital Expenditure Projects

### Project Acknowledgement

Corridors designated within the ASTROMAP System were planned to minimize the placement of truck routes within the downtown sectors of municipalities within the region. This was not a fully achievable goal given the criteria of not generating new or additional roadways. These conditions exist in centers such as Cartersville, Douglasville, and Winder, where there are not easily identified alternative routes. In towns and cities where this condition exists and is not desired, the further development of a more locally oriented truck route, in coordination with the ASTROMAP System should be pursued. This pursuit would not simply identify and assess, for designation, local roads to affect the “final mile” transport of goods within the jurisdiction, but also offer alternative routes to the ASTROMAP in these locations.

### CapEx NS-W2

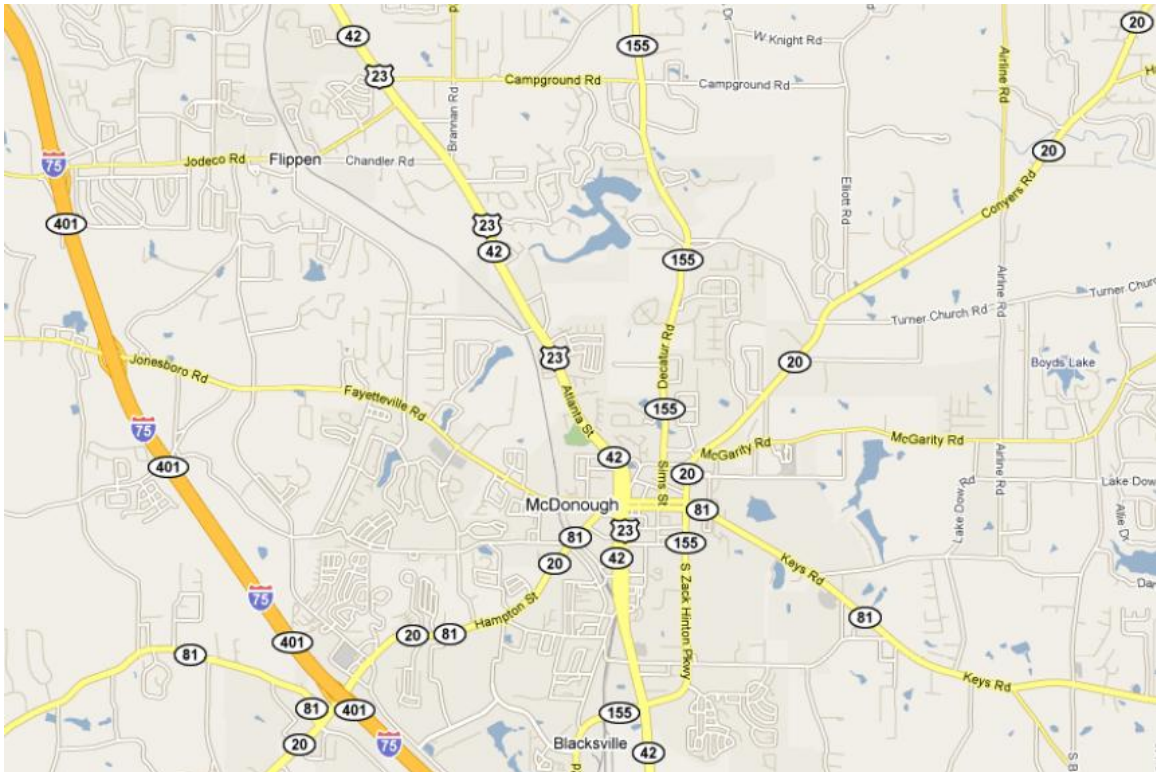
<b>Route</b>	NS-W2
<b>Location</b>	Intersection SR 92/SR 6 to Intersection SR 92/Bill Carruth Parkway
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	Excessive congestion
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add 2.5 miles of a center two-way left turn lane on SR 92.





CapEx NS-E1

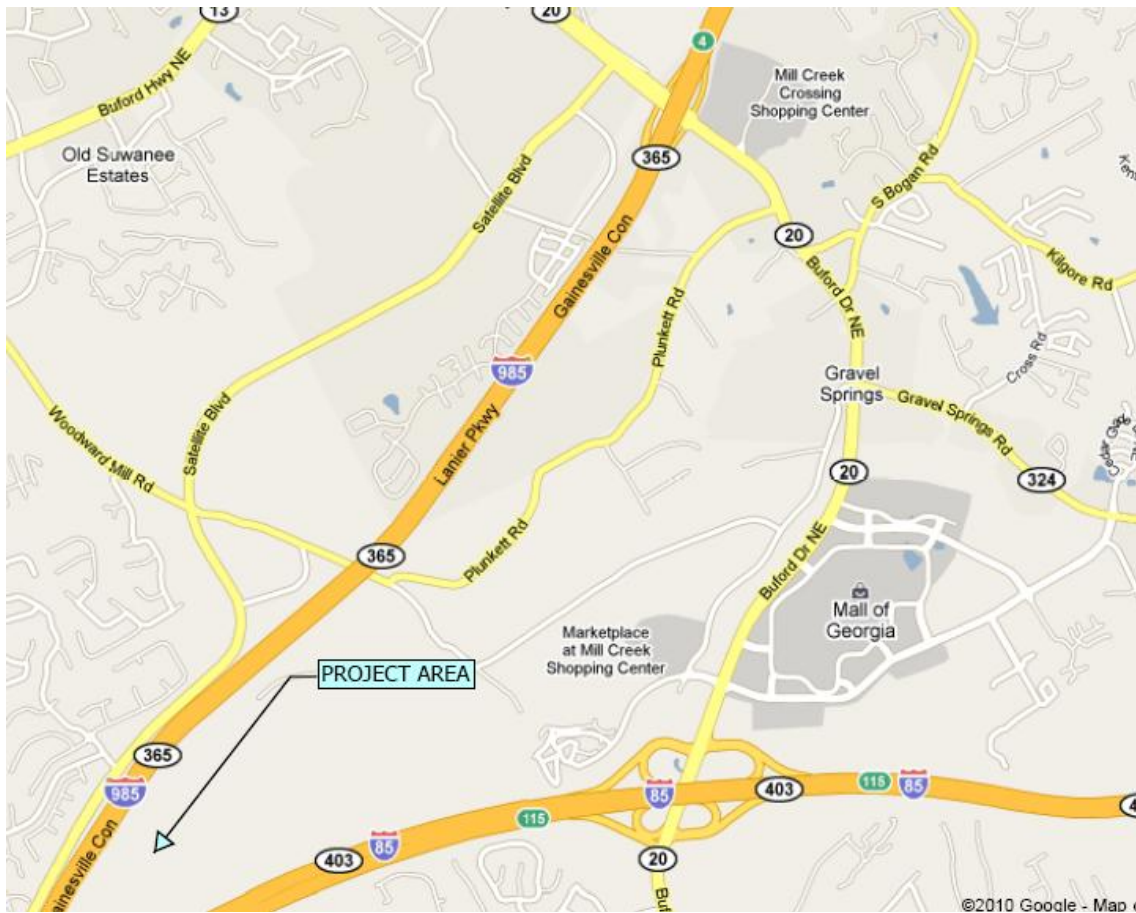
<b>Route</b>	NS-E1
<b>Location</b>	City of McDonough
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 20, 155, 81 & 87 converge in downtown McDonough causing severe congestion in the downtown area
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Construct a 12 mile long four-lane divided highway by-pass around the City of McDonough





CapEx NS-E2

<b>Route</b>	NS-E2
<b>Location</b>	SR 20 between I-85 and I-985
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	SR 20 has excessive congestion in this area due to the high traffic demands of the Mall of Georgia
<b>Proposed Actions</b>	Interim Solution: Do nothing
	<p>Long-term Solution:</p> <p>Option #1: Construct an interchange at the intersection of I-85 and I-985 that allows traffic on I-85 southbound to connect with I-985 northbound and the traffic from I-985 southbound to connect to I-85 northbound. With the construction of this interchange I-85 and I-985 would serve as a bypass around the Mall of Georgia</p> <p>Option #2: Construct a bypass around the Mall of Georgia</p>



### CapEx EW-N1

<b>Route</b>	EW-N1
<b>Location</b>	SR 78
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	There are numerous signalized and non signalized intersections from the intersection of SR 78/Mt. Vernon Rd to SR 78/Rockbridge Road resulting in congestion and time delays
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Convert approximately 35 miles of this roadway from controlled access to a limited access freeway.



CapEx EW-N1

<b>Route</b>	EW-N1
<b>Location</b>	SR 78 west from Northside Drive to I-285
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	There are numerous signalized and non-signalized intersections resulting in congestion and time delays
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add six miles of a center two-way left turn lane



CapEx EW-N2

<b>Route</b>	EW-N2
<b>Location</b>	SR 316
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	There are numerous signalized and non-signalized intersections on SR 316 from SR 211 to I-85
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Convert 40 miles of this roadway from controlled access to a limited access freeway.





CapEx EW-N4

<b>Route</b>	EW-N4
<b>Location</b>	SR 20 from Peachtree Industrial Blvd to Samples Road
<b>Source</b>	AstroMap/Field Observation
<b>Jurisdiction</b>	GDOT
<b>Concern</b>	This is eight miles of two-lane roadway with a significant demand for left-turn movements resulting in severe congestion
<b>Proposed Actions</b>	Interim Solution: Do nothing
	Long-term Solution: Add a center two-way left turn lane

